

FIG. 1

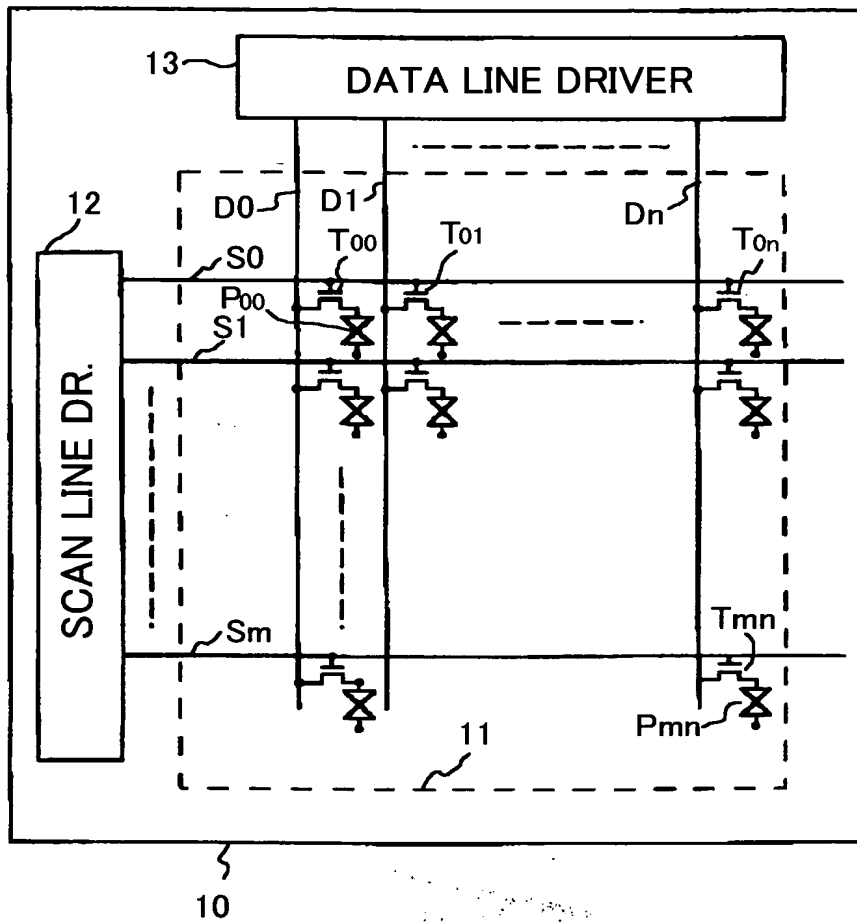
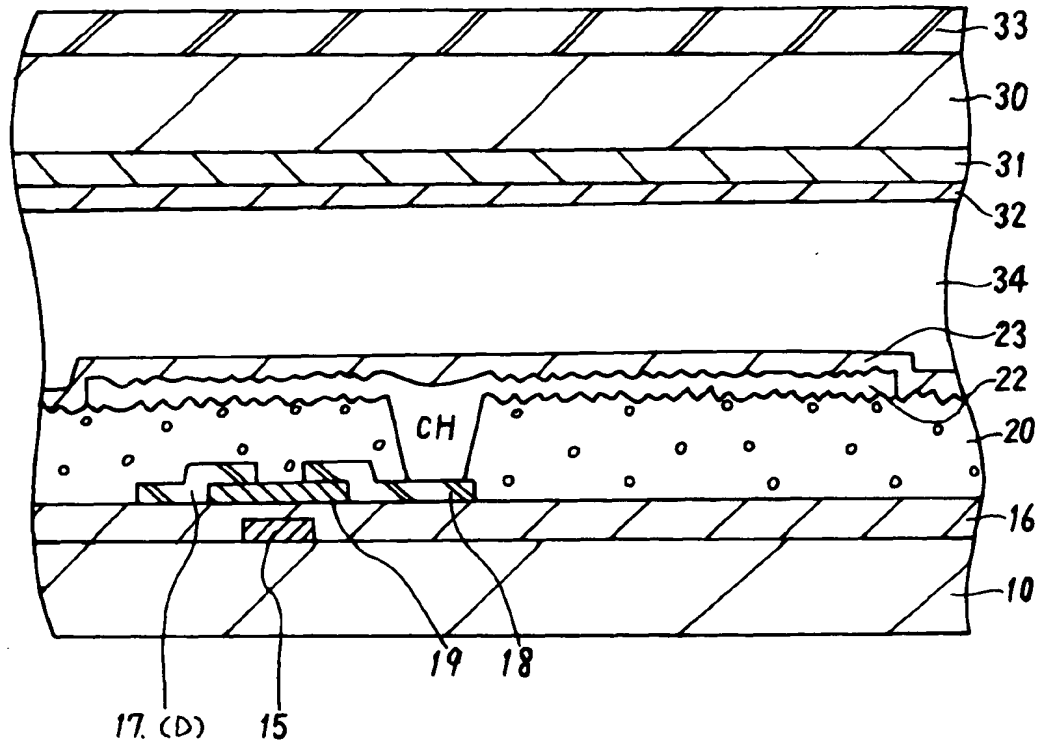


FIG. 2



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FIG. 3A

Resist deposition
 Pre-baking

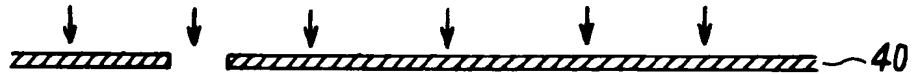
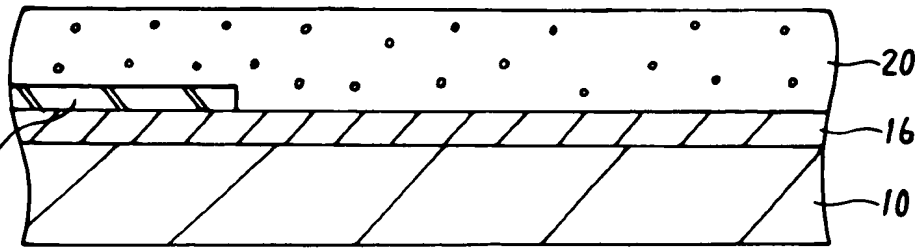
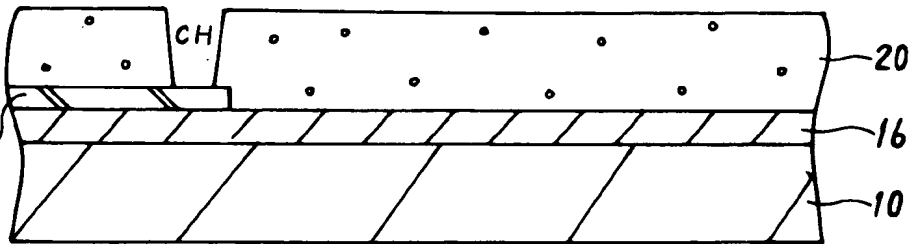


FIG. 3B

Exposure &
 Development
 for contact hole,
 Post-baking



DUV



FIG. 3C

DUV irradiation

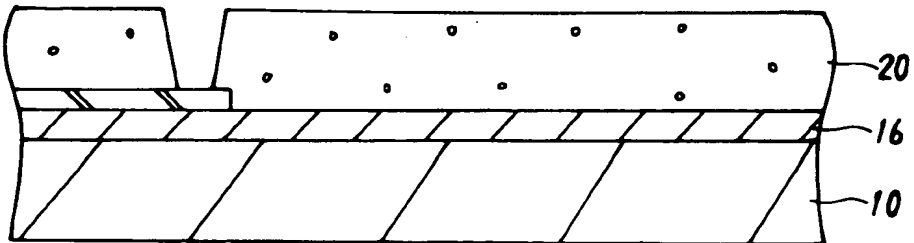


FIG. 3D

Final baking

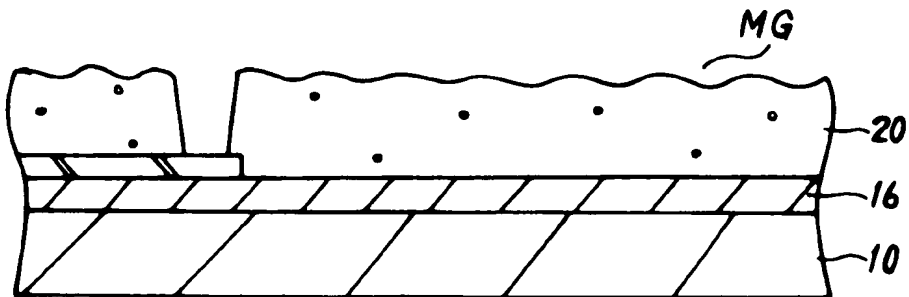


FIG. 4

Thickness $2 \mu\text{m}$

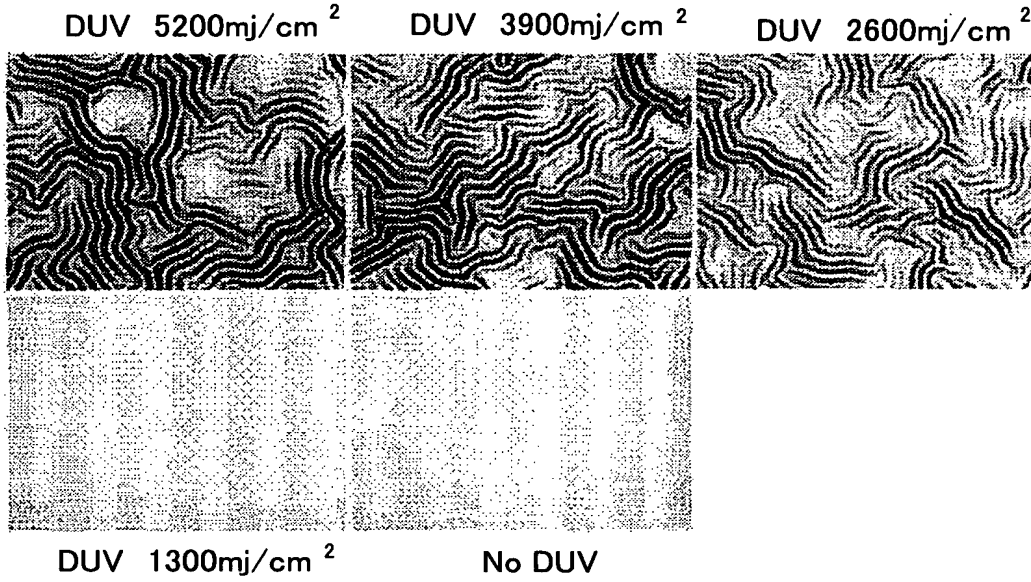
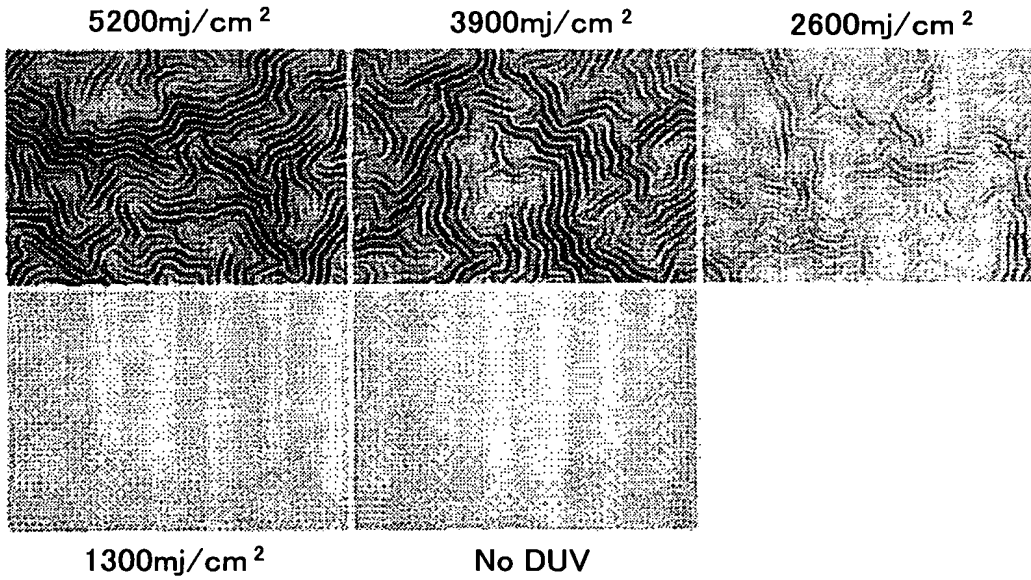


FIG. 5

Thickness $1.7 \mu\text{m}$



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FIG. 6

Thickness $1.4 \mu\text{m}$

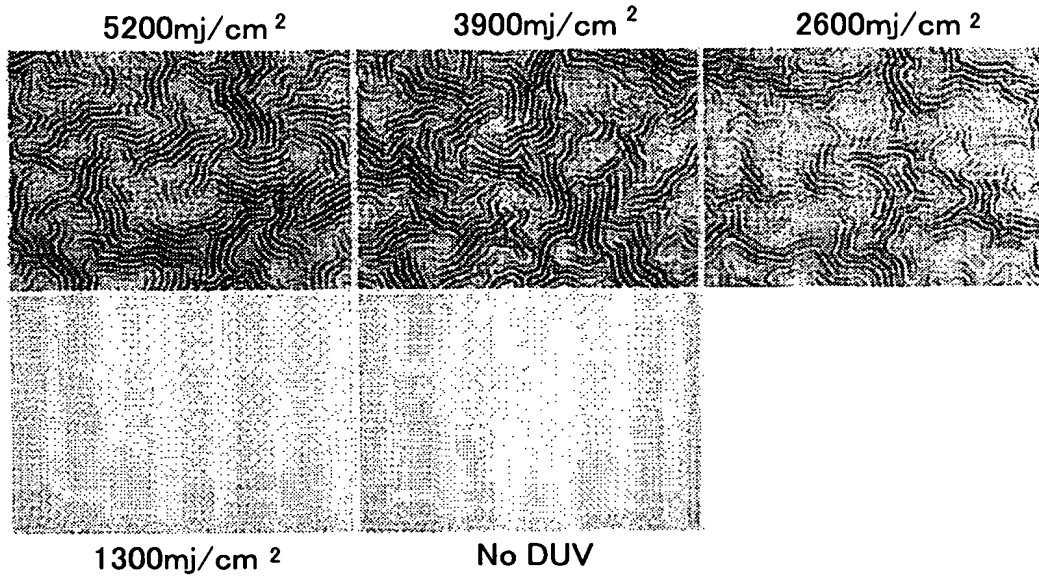


FIG. 7

Thickness $1.0 \mu\text{m}$

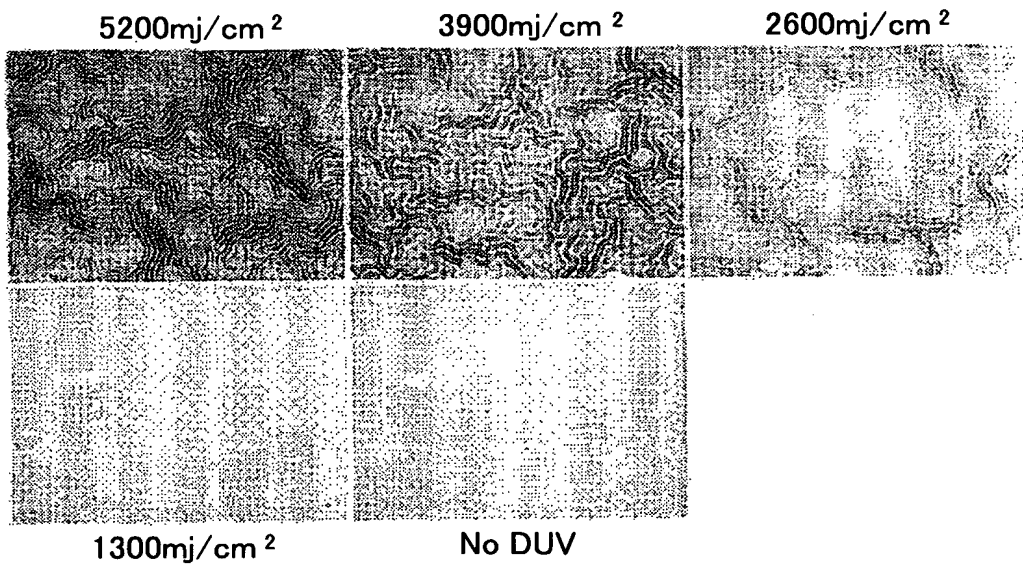


FIG. 8A

Thickness $1.7 \mu\text{m}$

Average inclination angle $k=13^\circ$

Height difference of undulation : $1.3 \mu\text{m}$

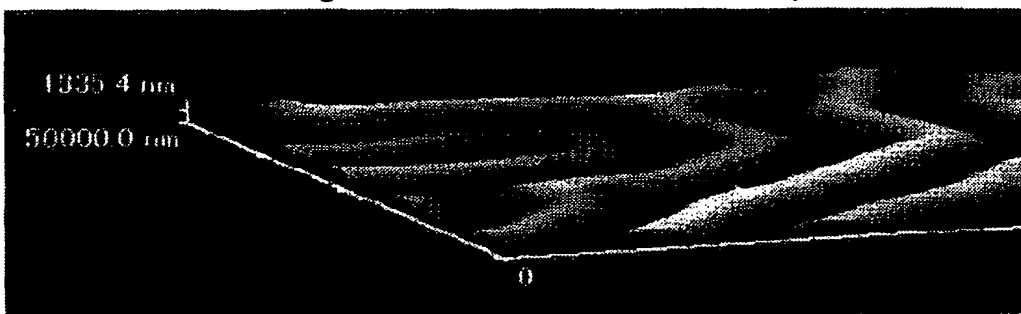


FIG. 8B

Thickness $1.4 \mu\text{m}$

Average inclination angle $k=11^\circ$

Height difference of undulation : $1.1 \mu\text{m}$

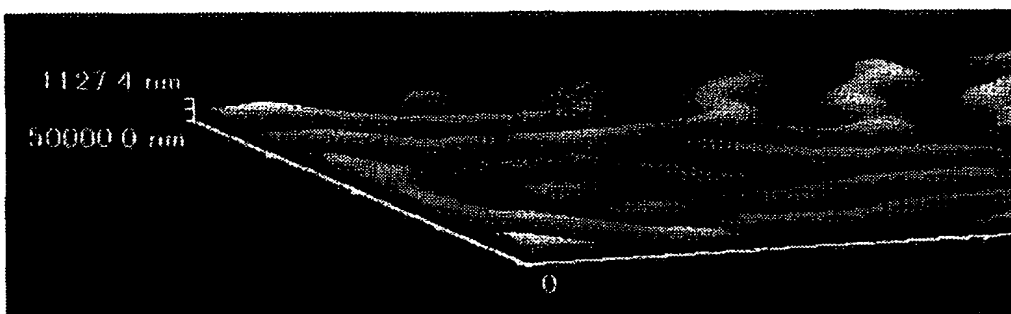
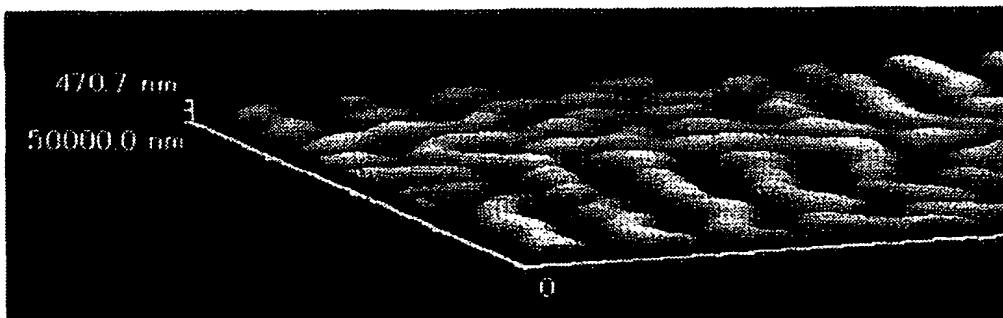


FIG. 8C

Thickness $1 \mu\text{m}$

Average inclination angle $k=8^\circ$

Height difference of undulation : $0.5 \mu\text{m}$



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FIG. 9

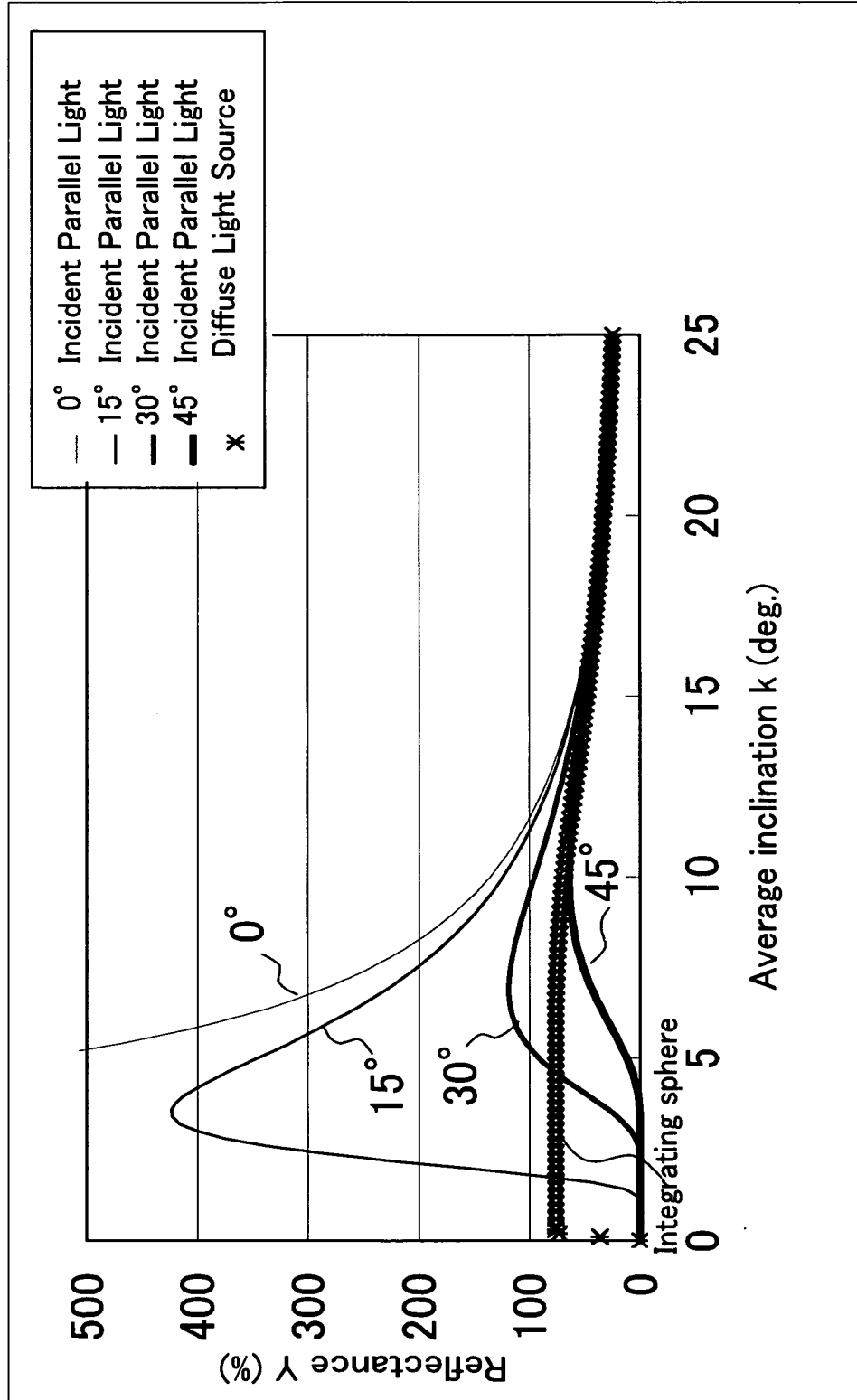


FIG. 10

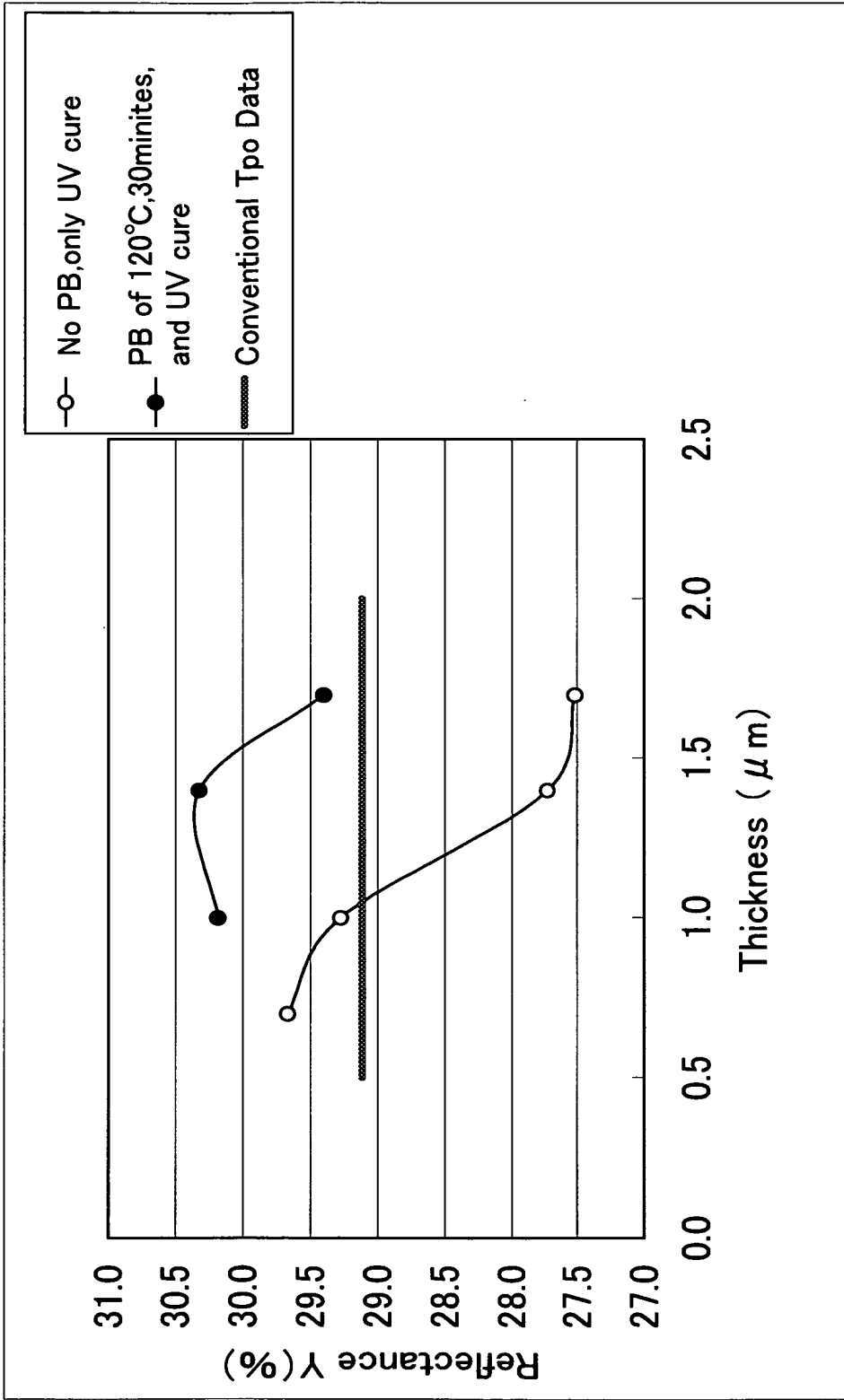


FIG. 11A

Rough undulation

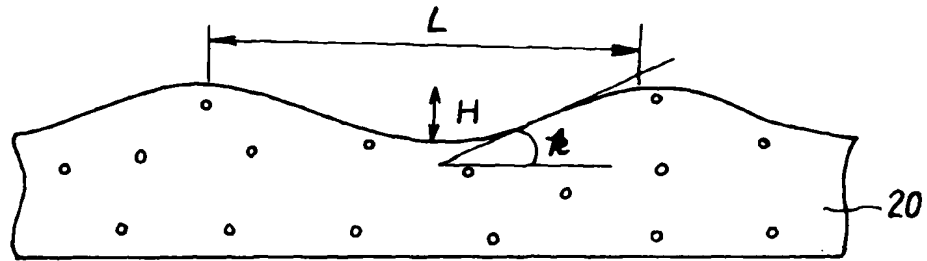


FIG. 11B

Fine undulation

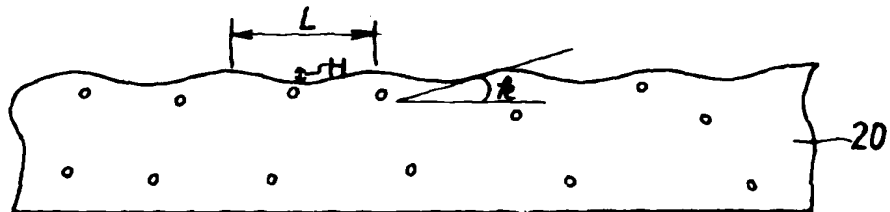


FIG. 12A



FIG. 12B

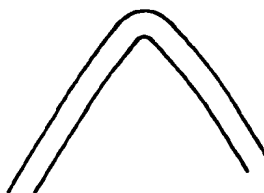


FIG. 12C

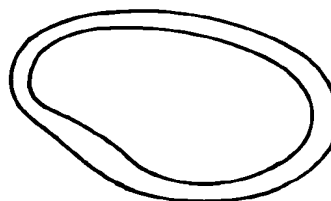
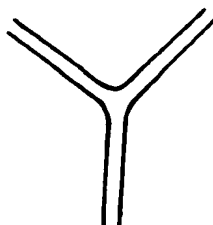


FIG. 12D



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FIG. 13A

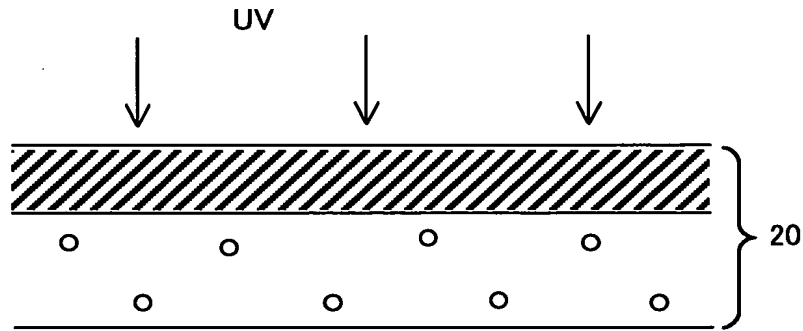
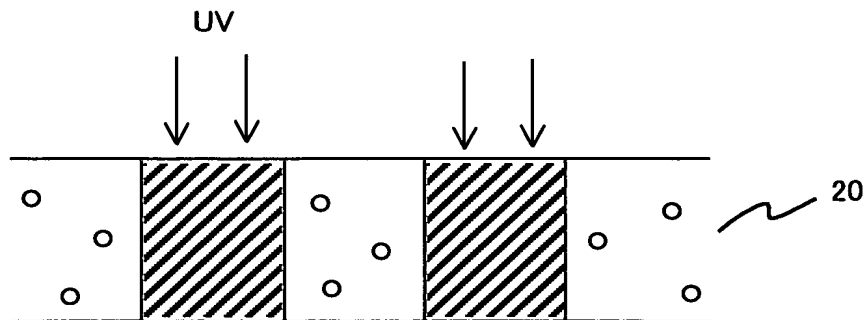


FIG. 13B



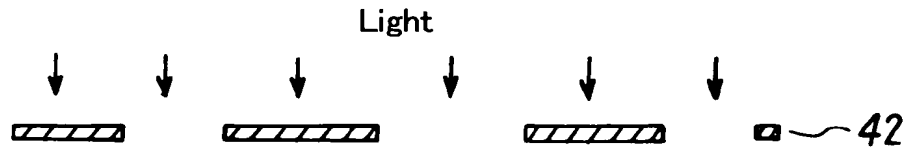


FIG. 14A

Exposure

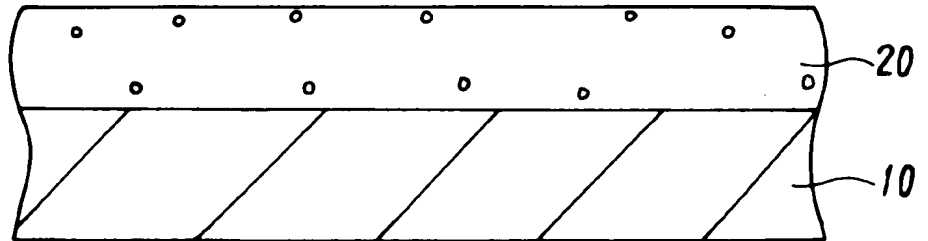


FIG. 14B

Development
 UV irradiation

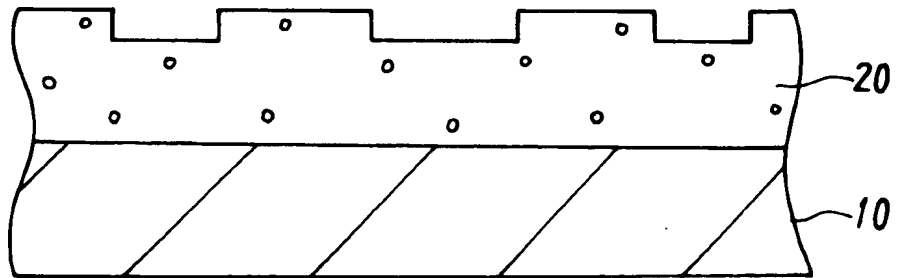
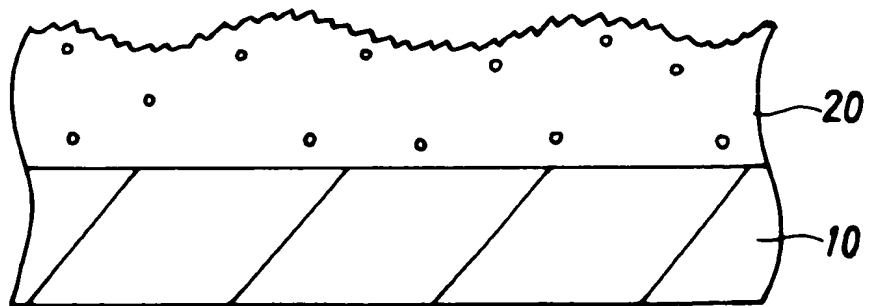


FIG. 14C

Final baking



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FIG. 15

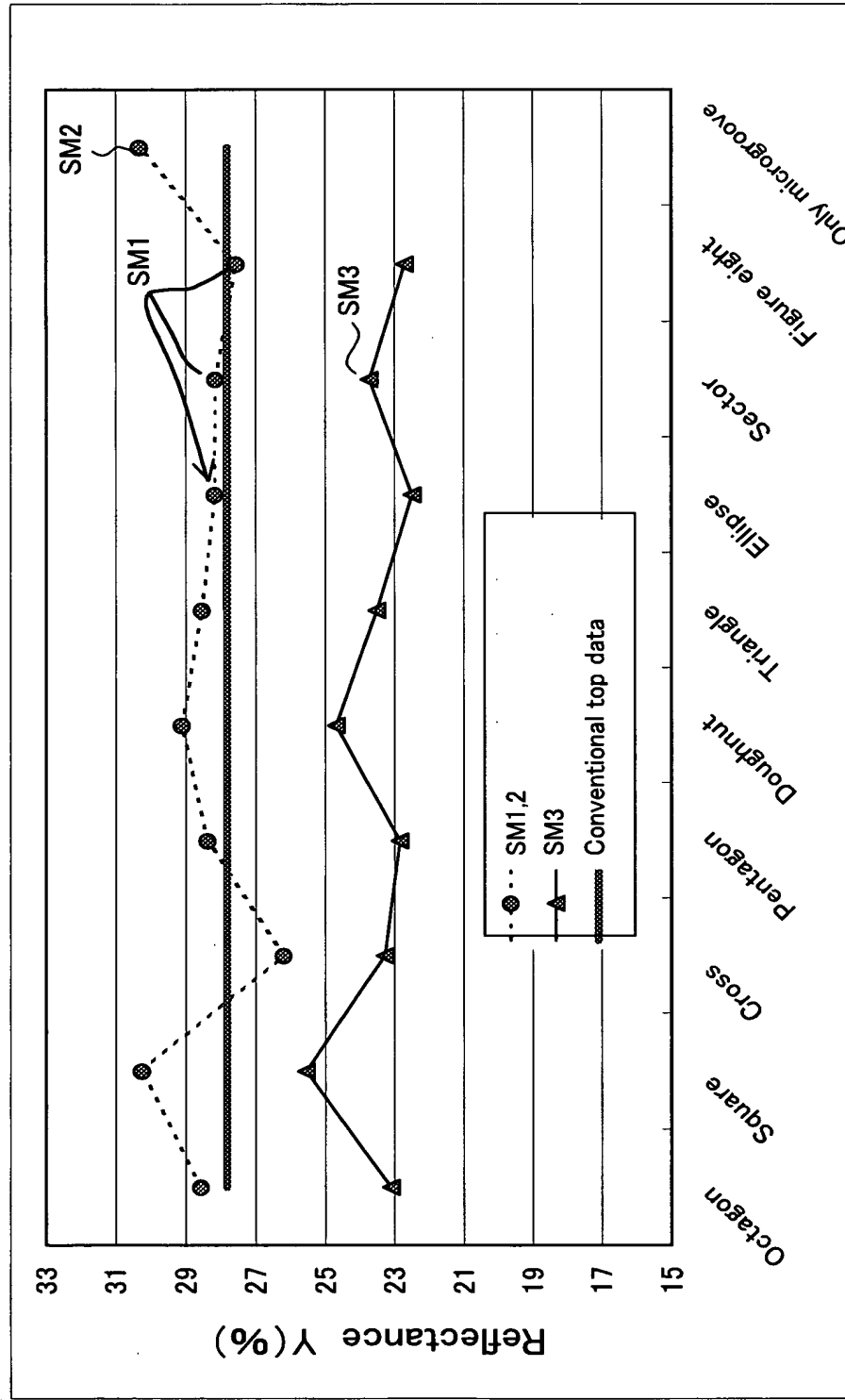


FIG. 16A

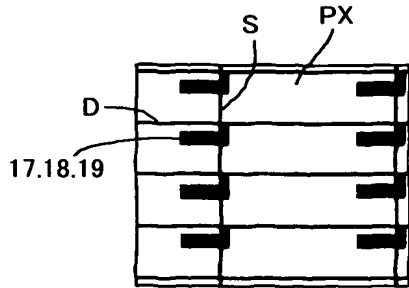


FIG. 16C

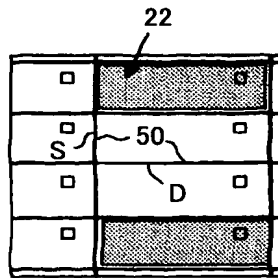


FIG. 16E

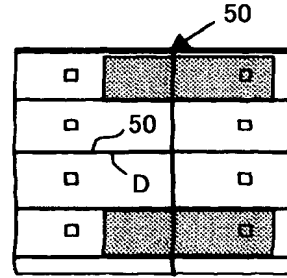


FIG. 16B

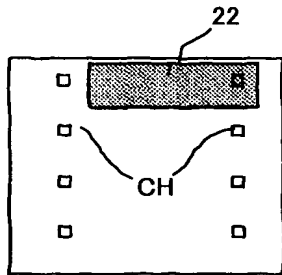


FIG. 16D

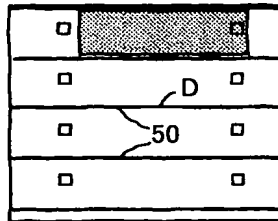
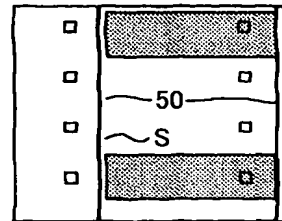


FIG. 16F



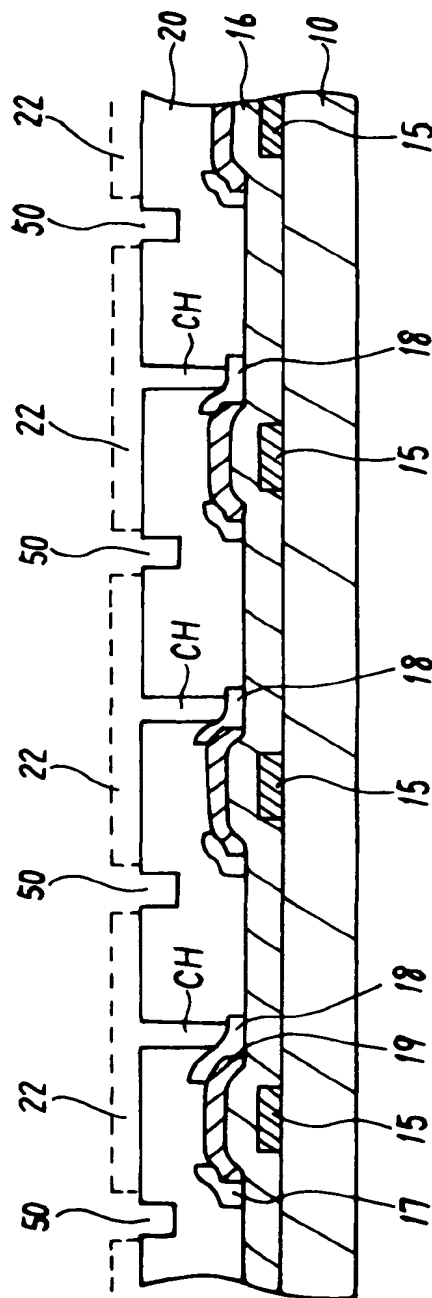
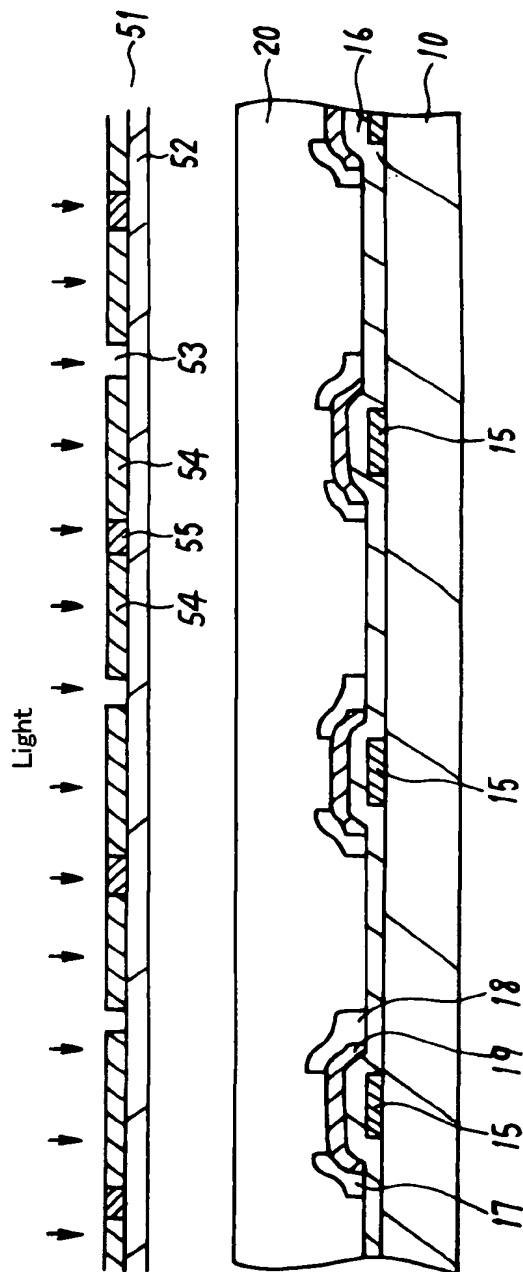
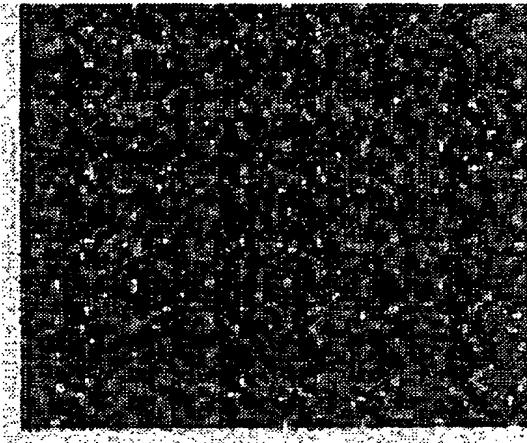
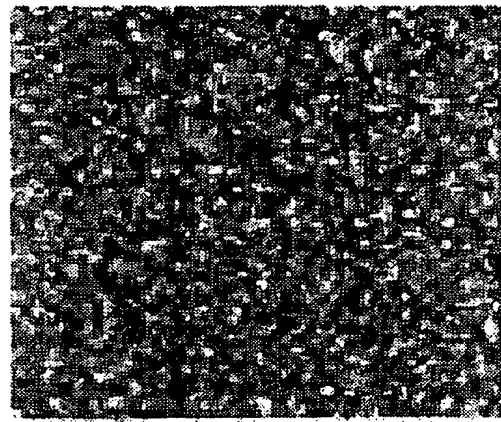


FIG. 18A



with separation line

FIG. 18B



without separation line

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FIG. 19

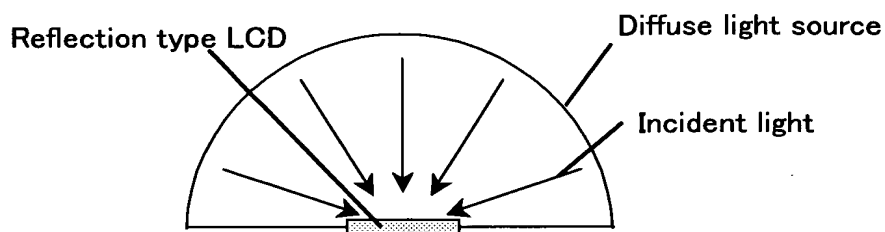
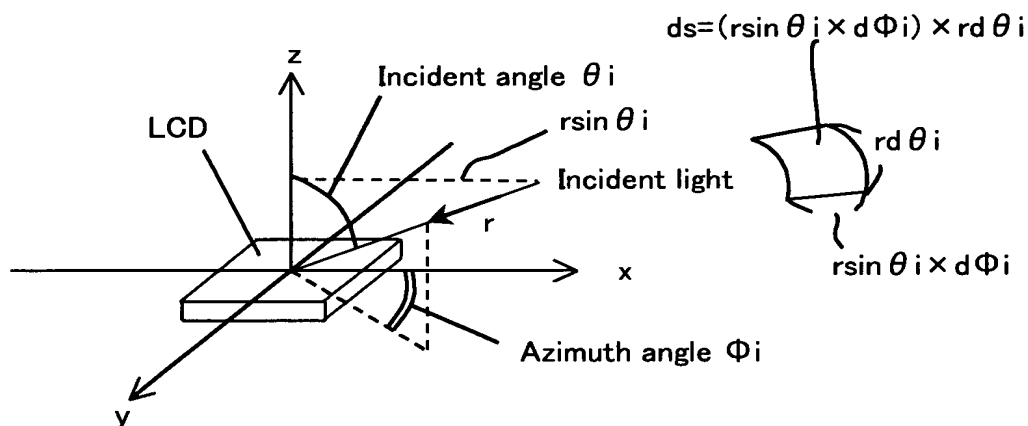


FIG. 20



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FIG. 21

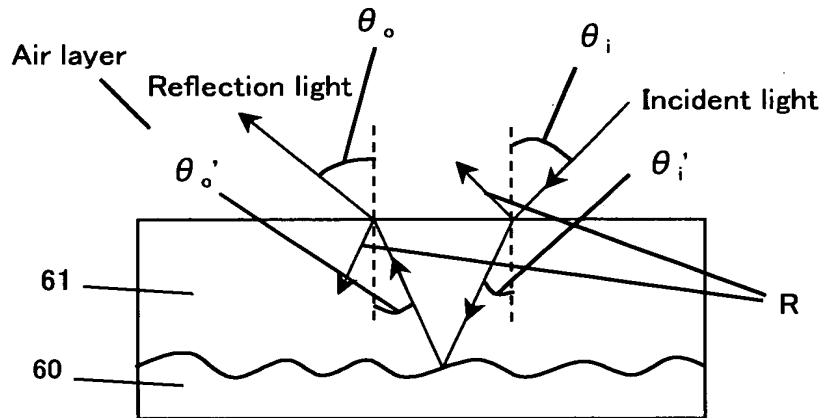


FIG. 22

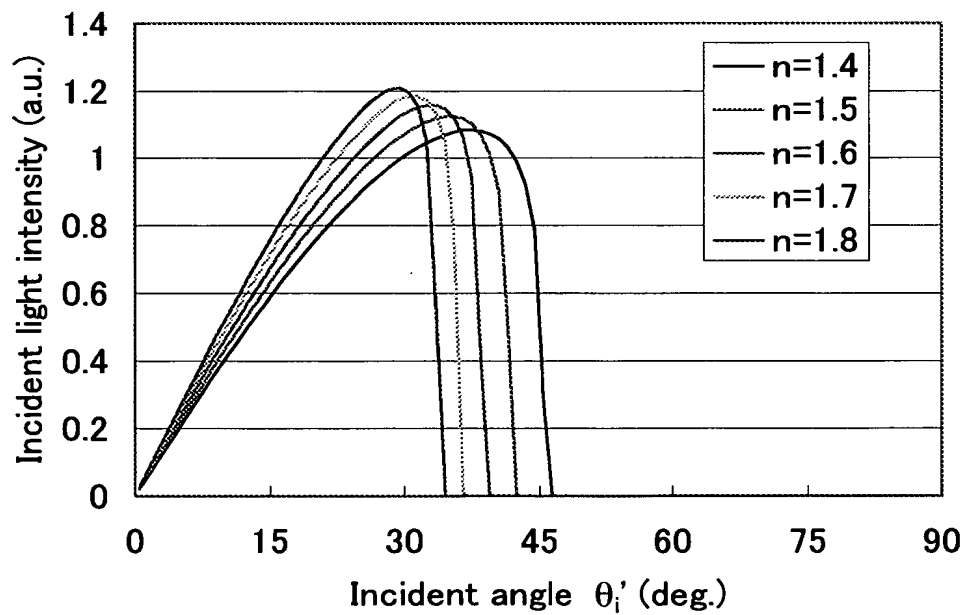


FIG. 23

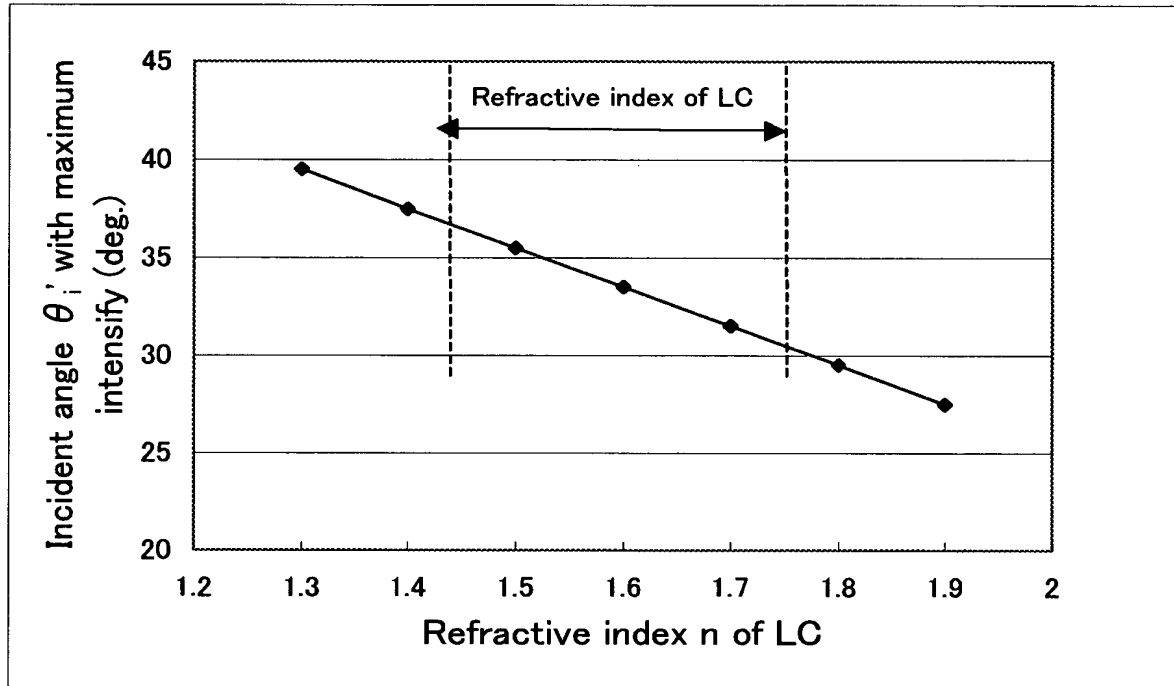


FIG. 24

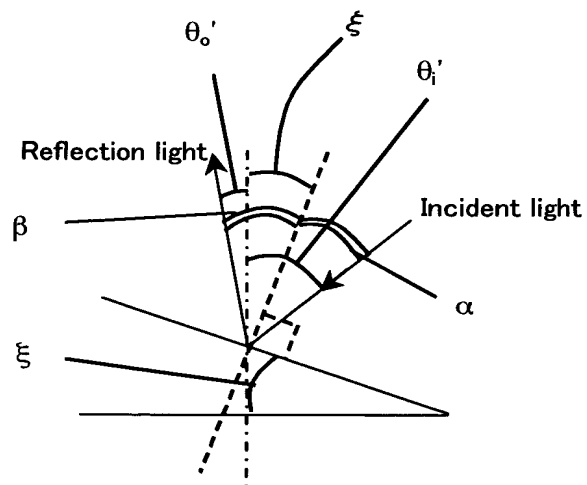


FIG. 25

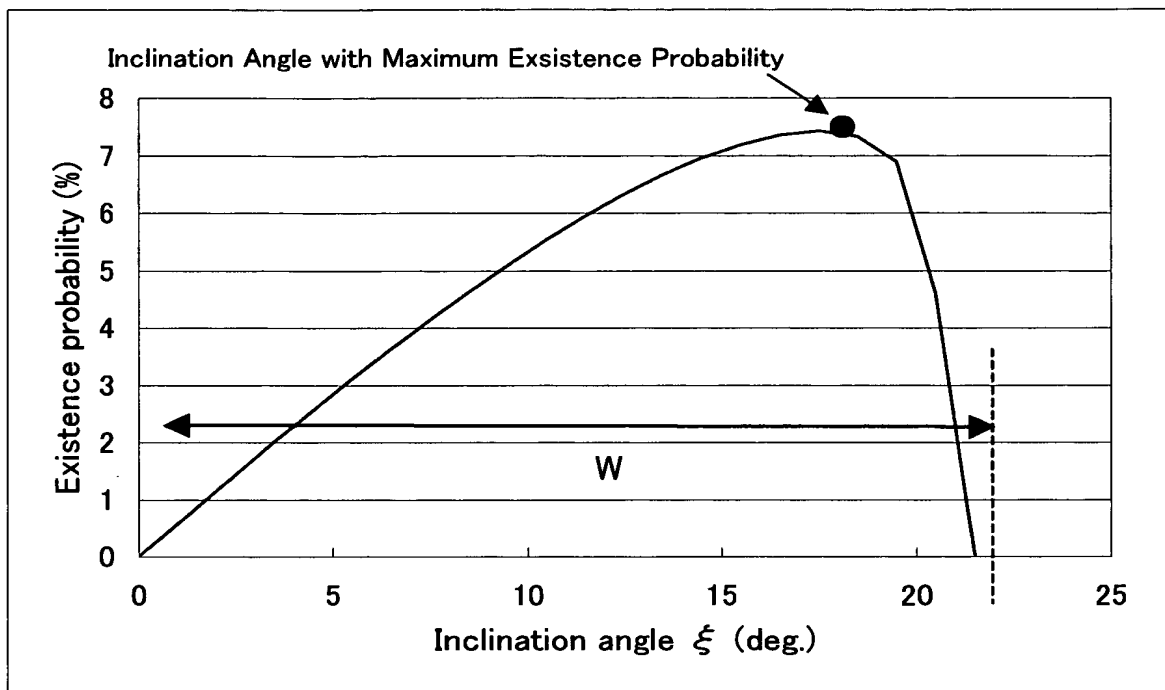


FIG. 26

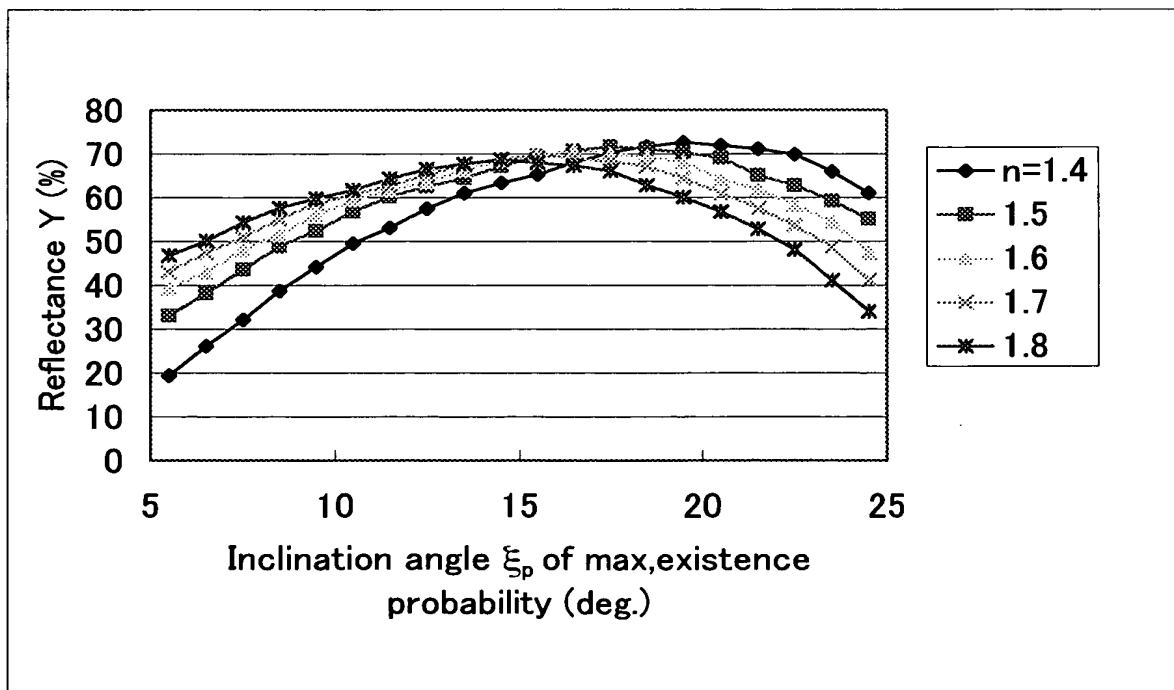
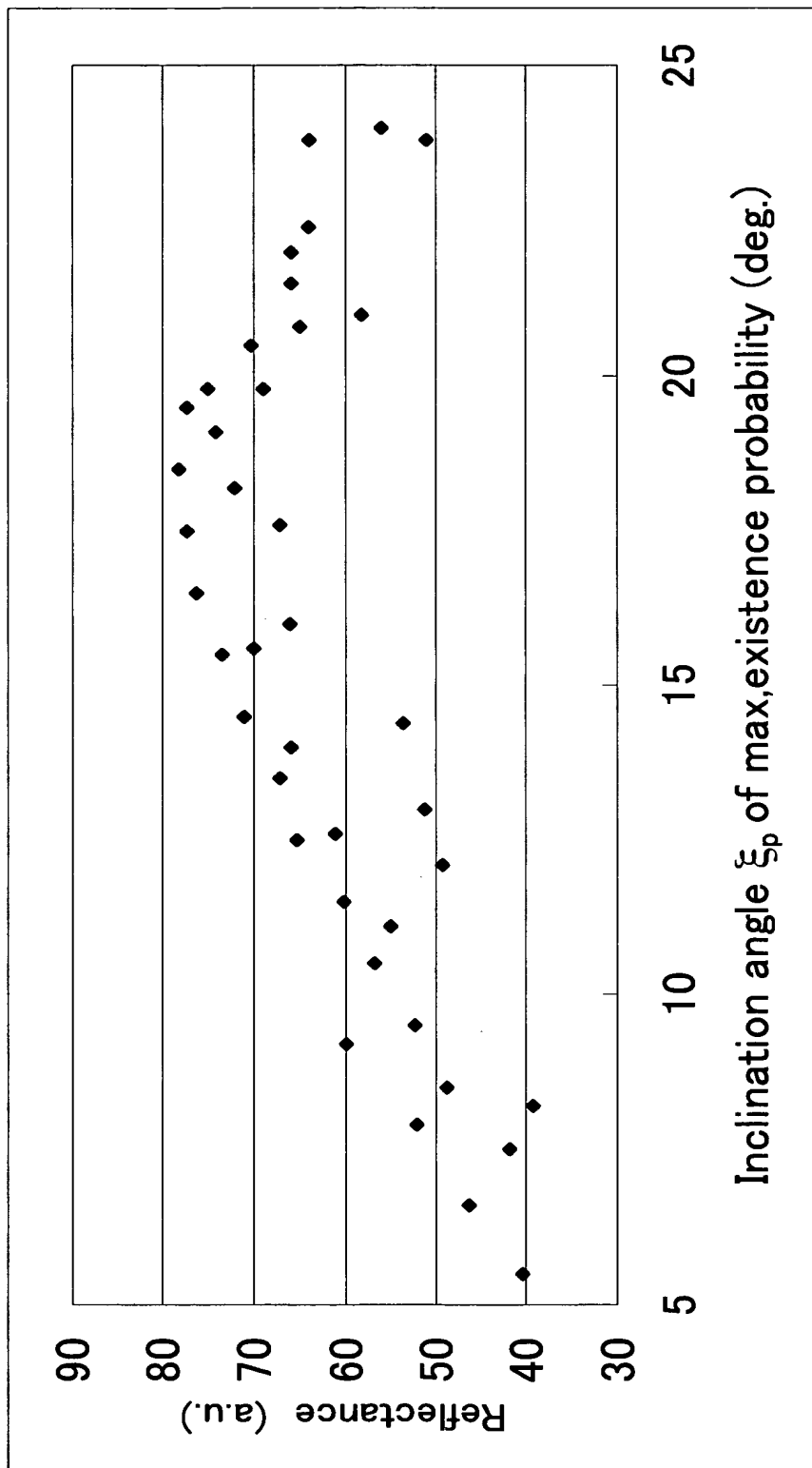


FIG. 27



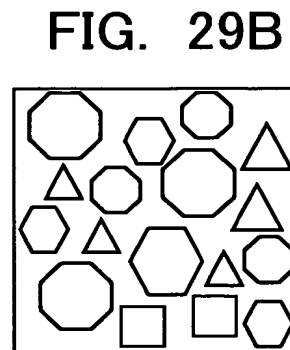
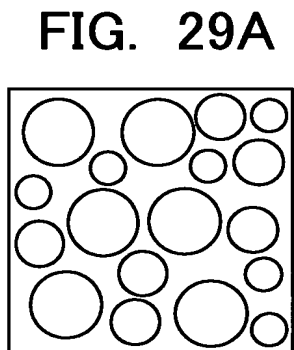
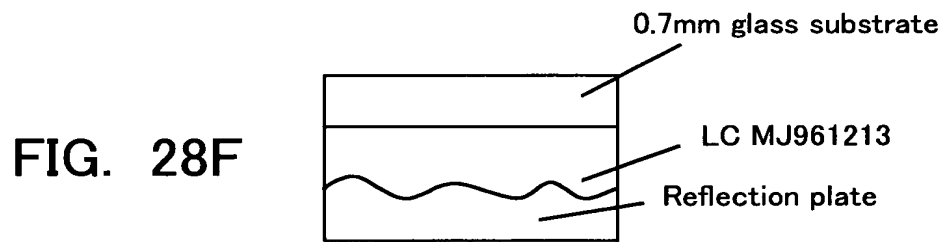
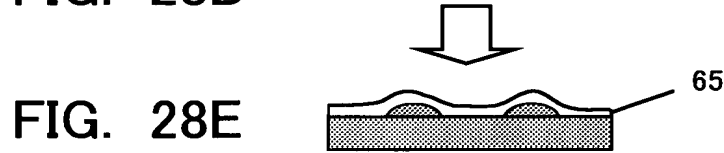
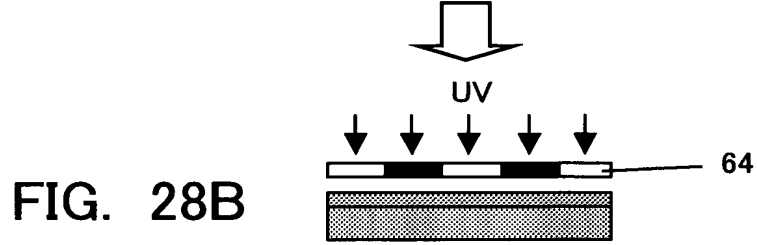
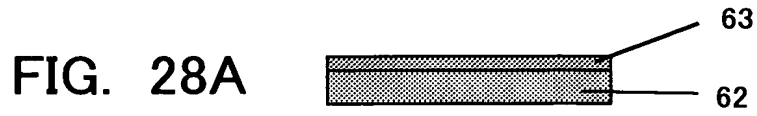


FIG. 30

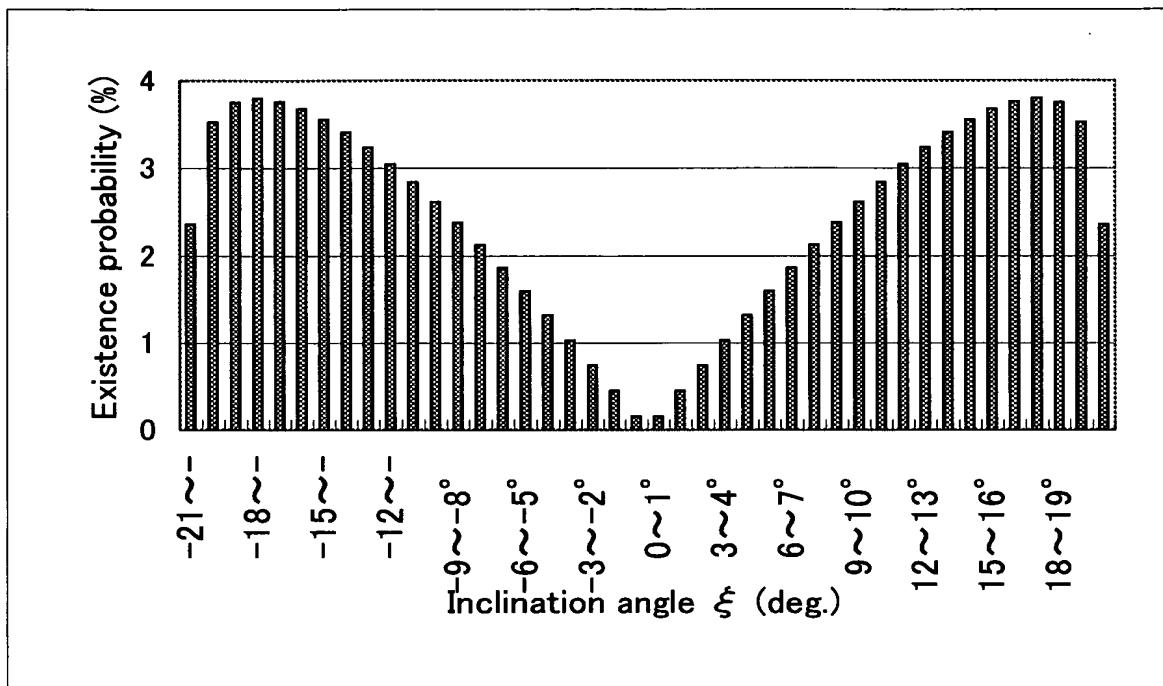


FIG. 31

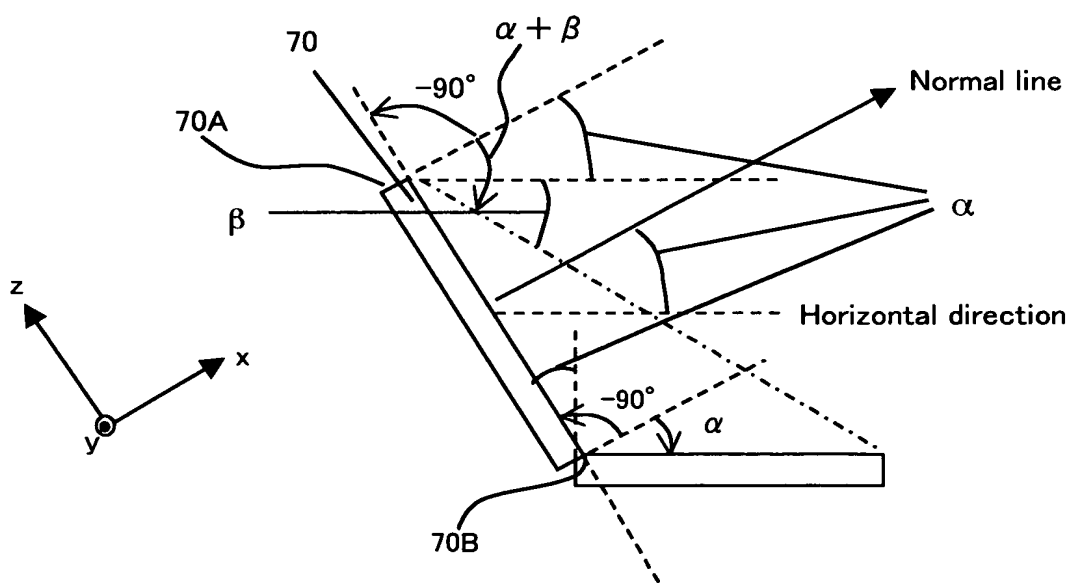


FIG. 32

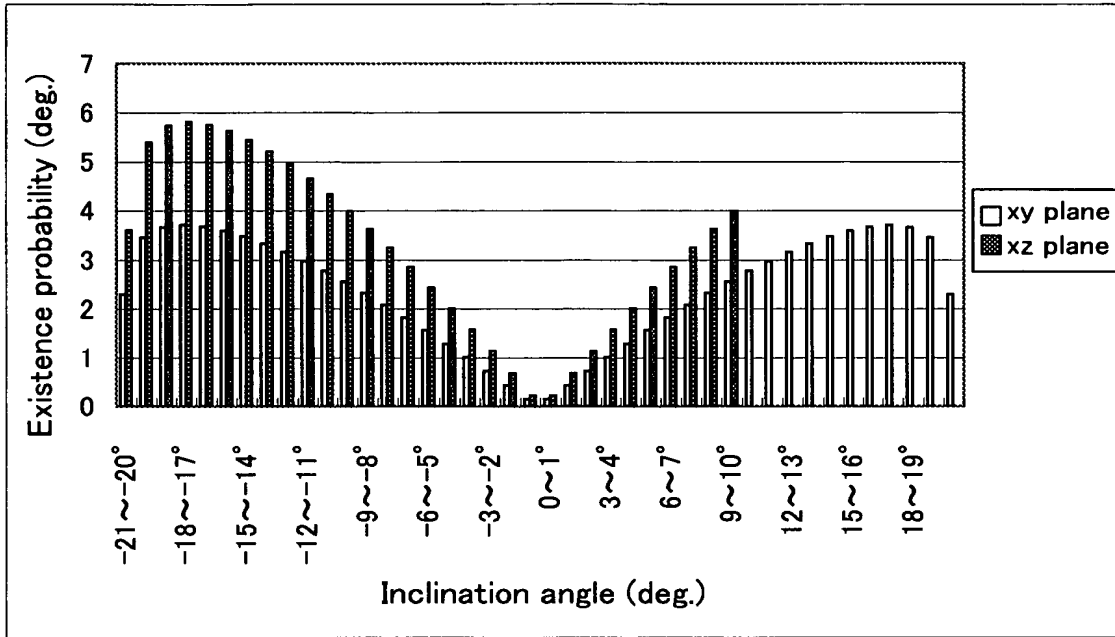
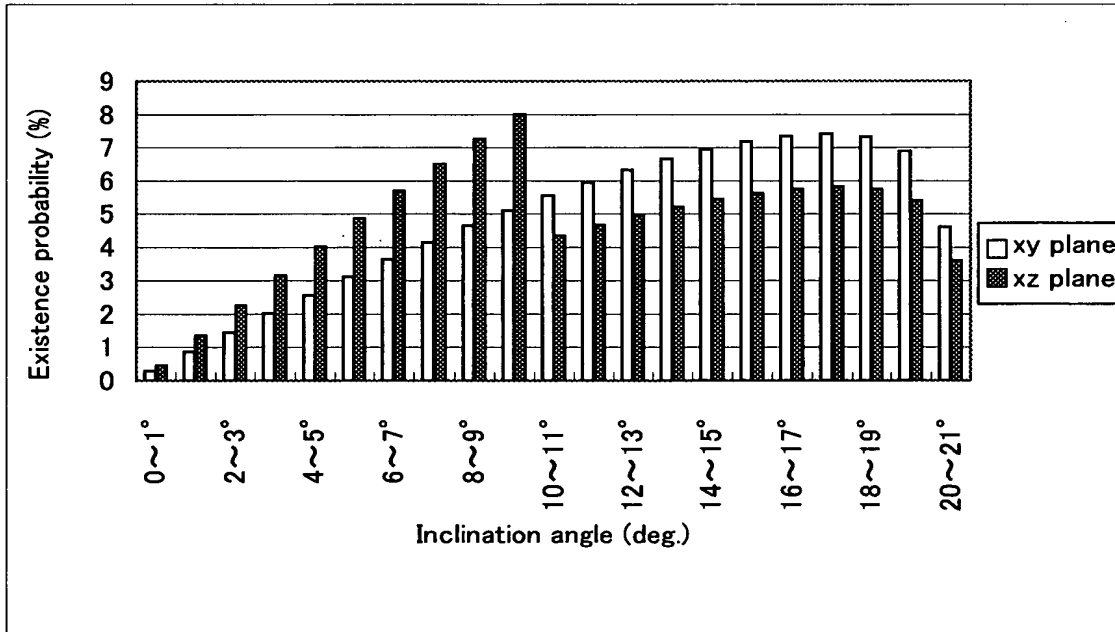


FIG. 33



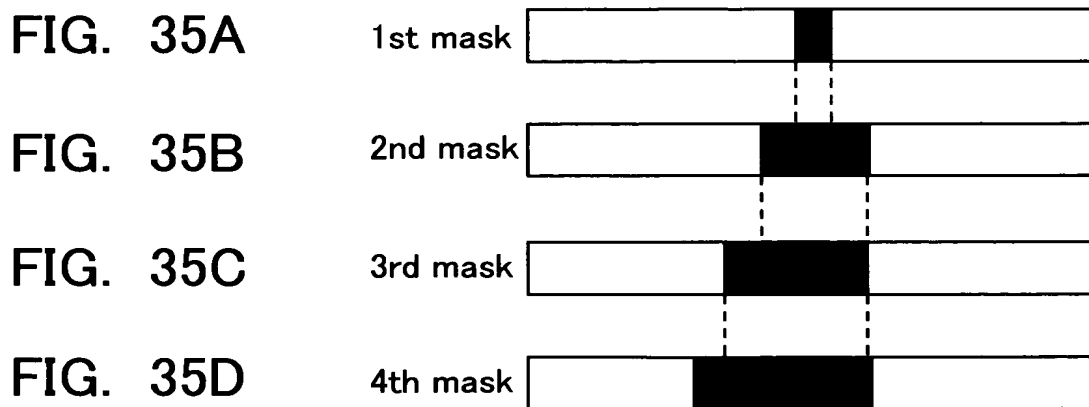
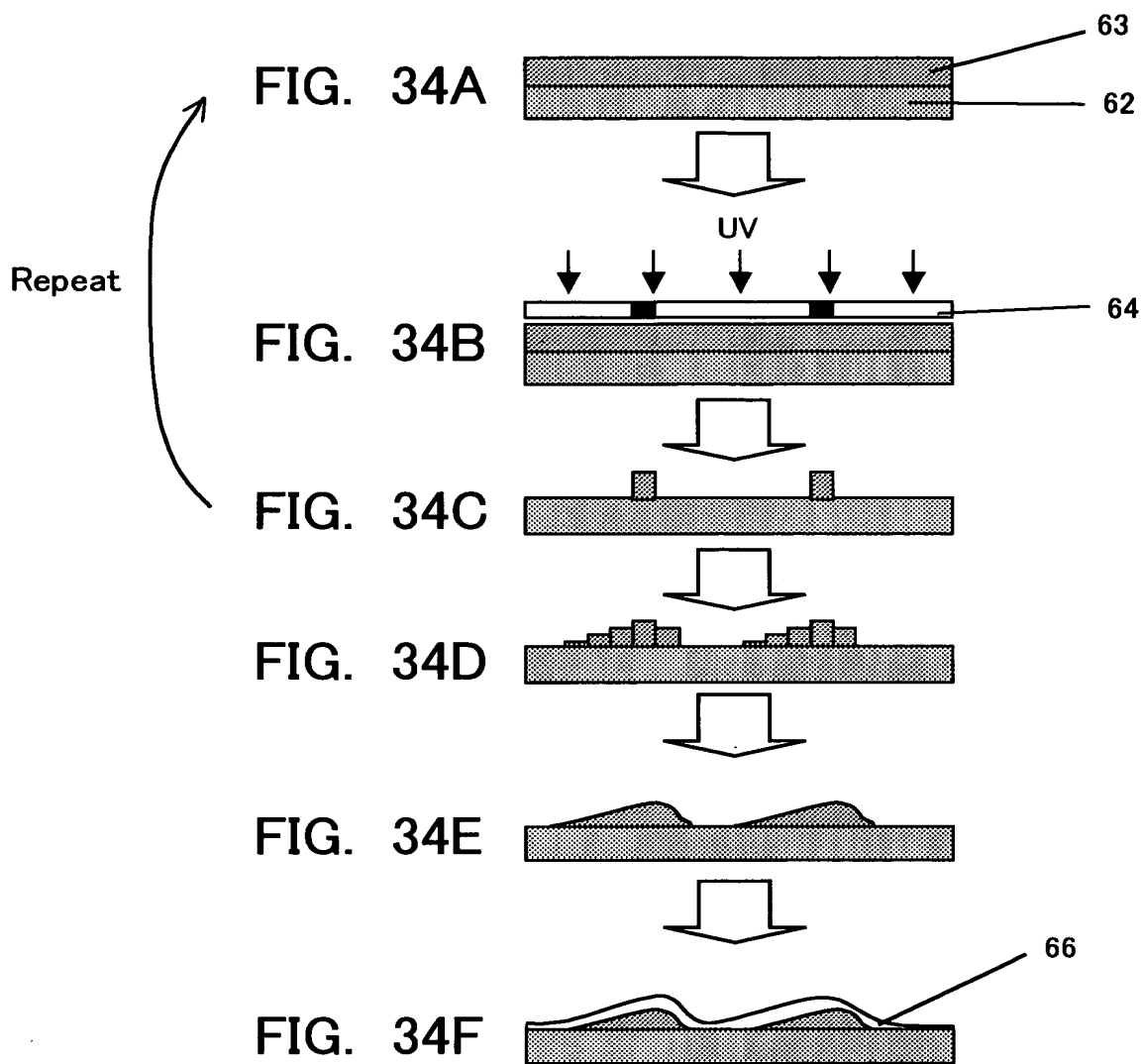
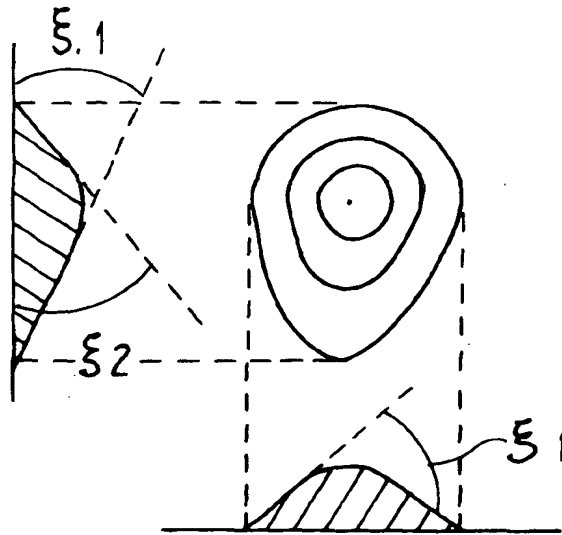


FIG. 36



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FIG. 37

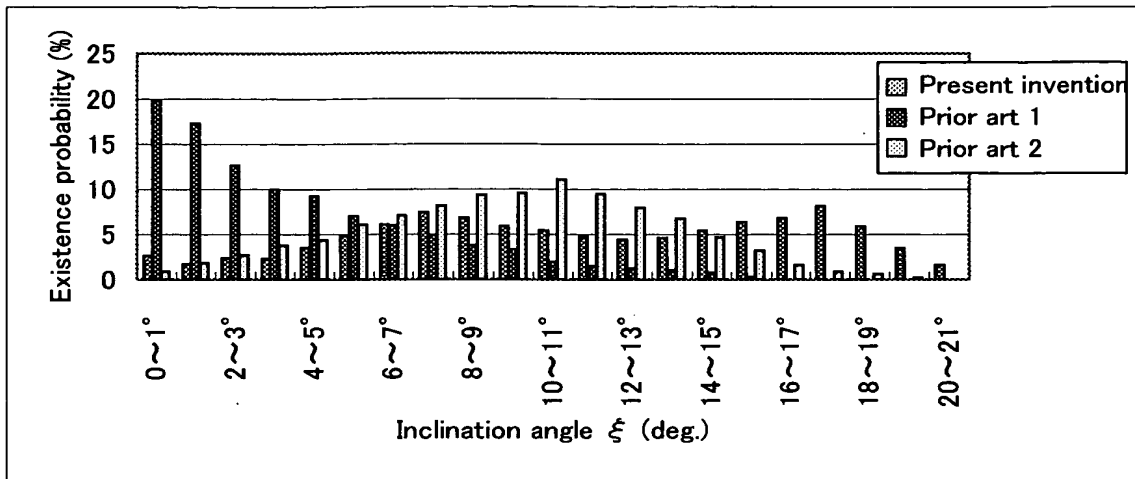


FIG. 38

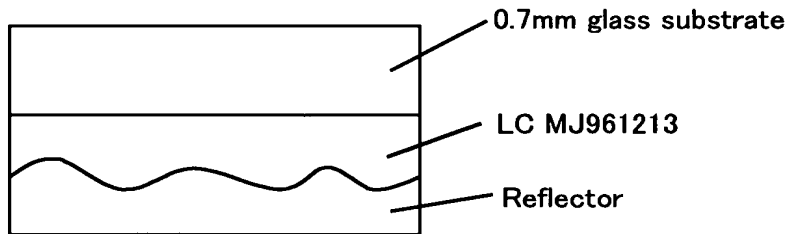


FIG. 39

Measurement result of reflectance

	Present invention	Prior art 1	Prior art 2
Reflectance	61%	31%	53%

Present invention : Existence probability of indication angle is maximum at 8° - 18°

Prior art 1 : Existence probability of indication angle is maximum at only 0°

Prior art 2 : Existence probability of indication angle is maximum at only 10°

FIG. 40

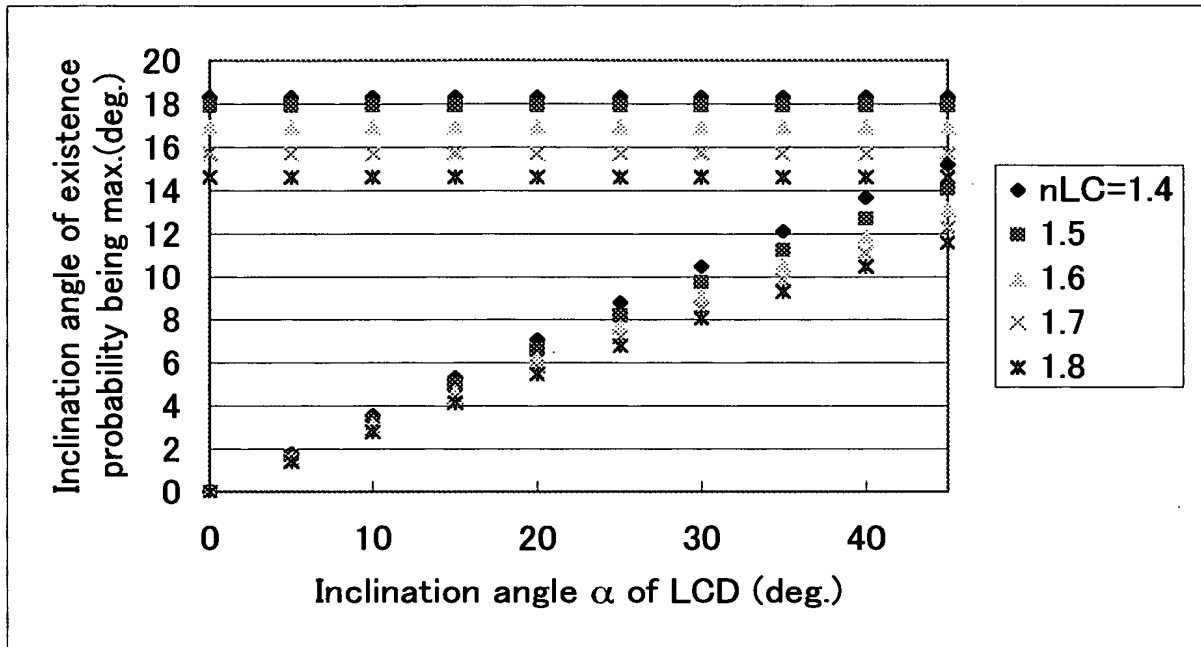


FIG. 41

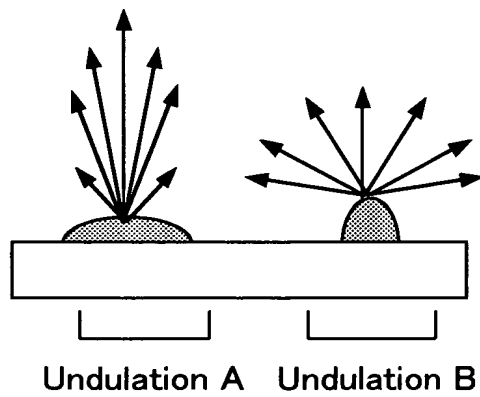
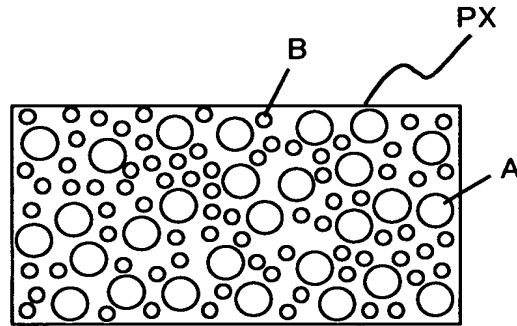


FIG. 42



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FIG. 43A



FIG. 43B

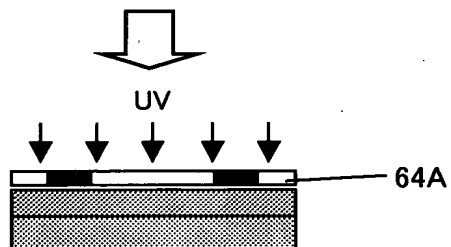


FIG. 43C

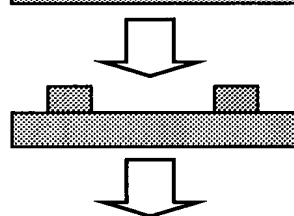


FIG. 43D

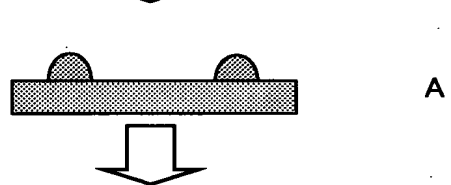


FIG. 43E



FIG. 43F

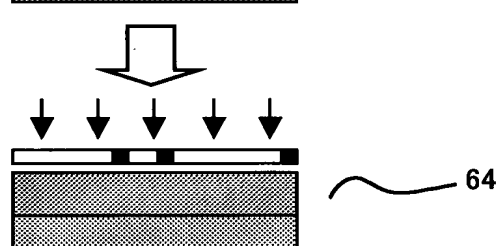


FIG. 43G

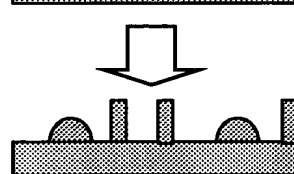


FIG. 43H

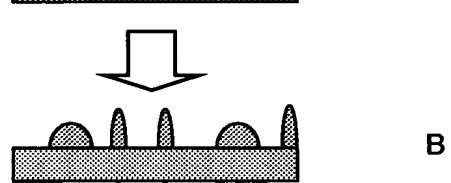
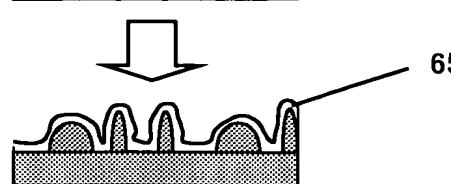
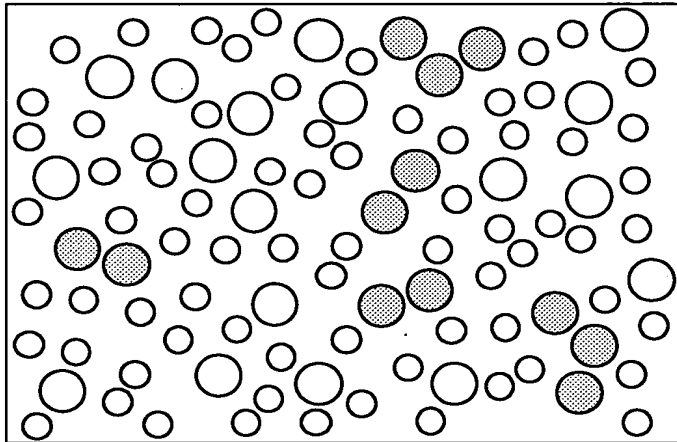


FIG. 43I



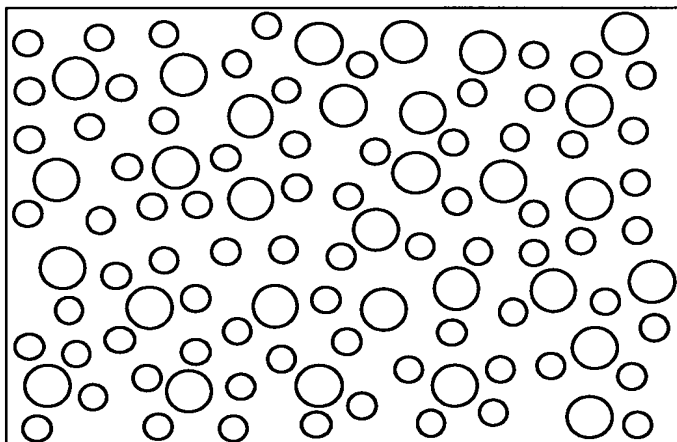
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FIG. 44



Unite image

FIG. 45



Unite image

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FIG. 46A

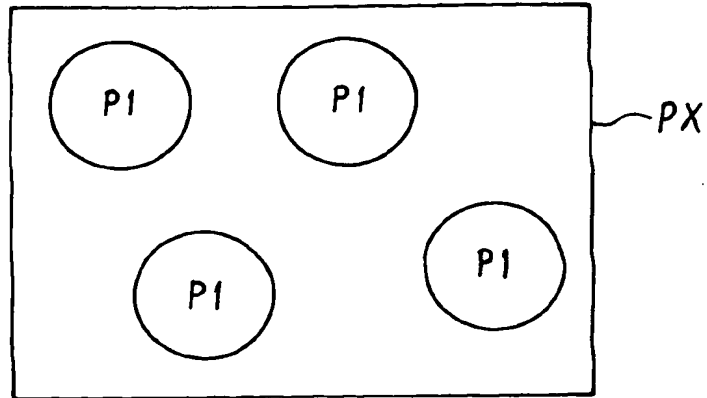


FIG. 46B

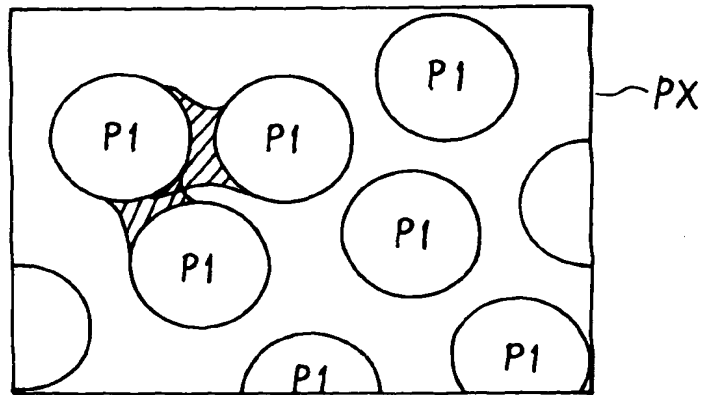
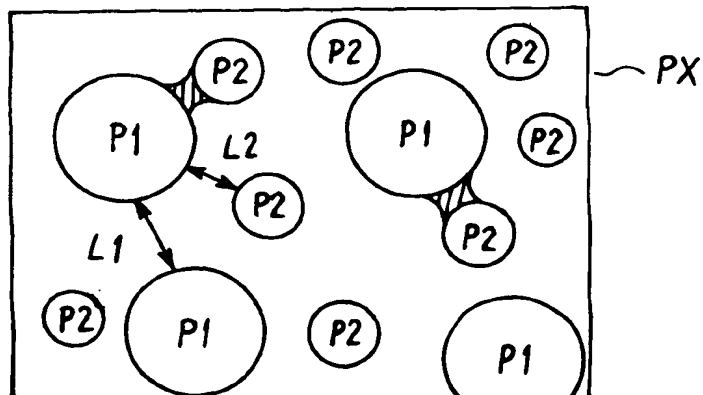


FIG. 46C



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FIG. 47

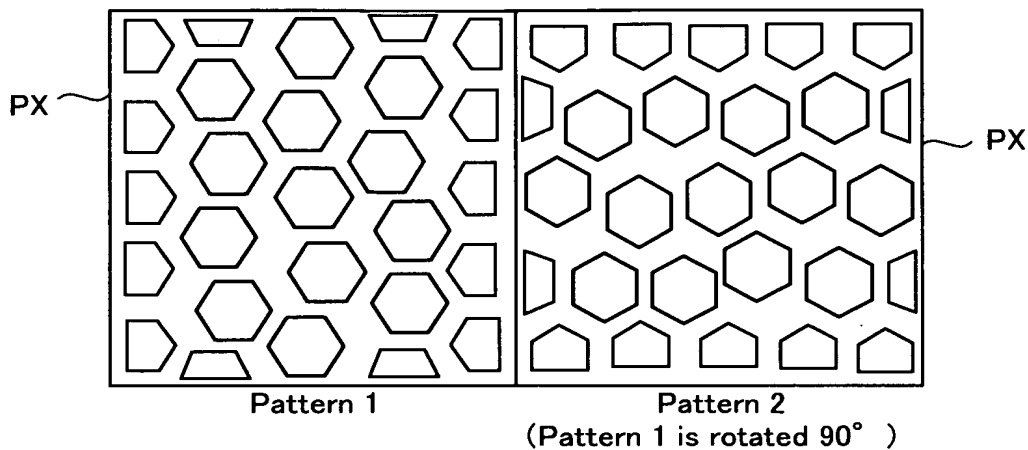


FIG. 48

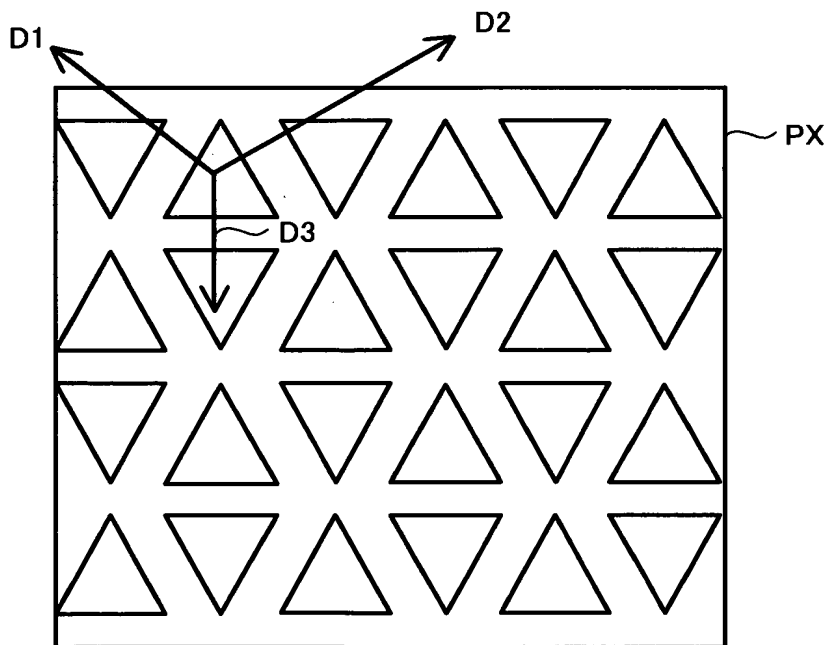
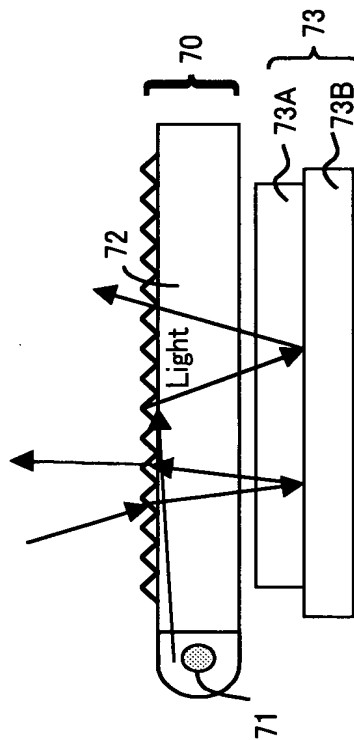


FIG.49

Prior Art



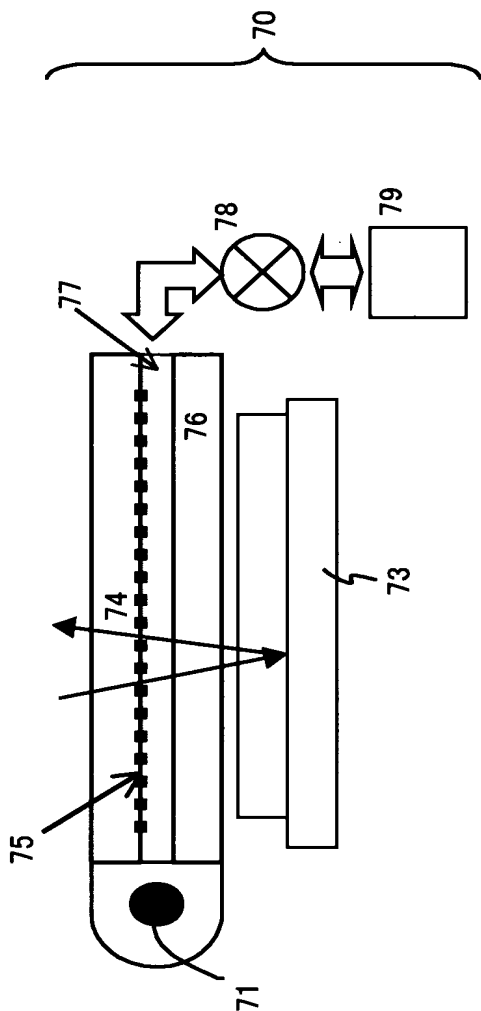


FIG. 50A
 At bright place

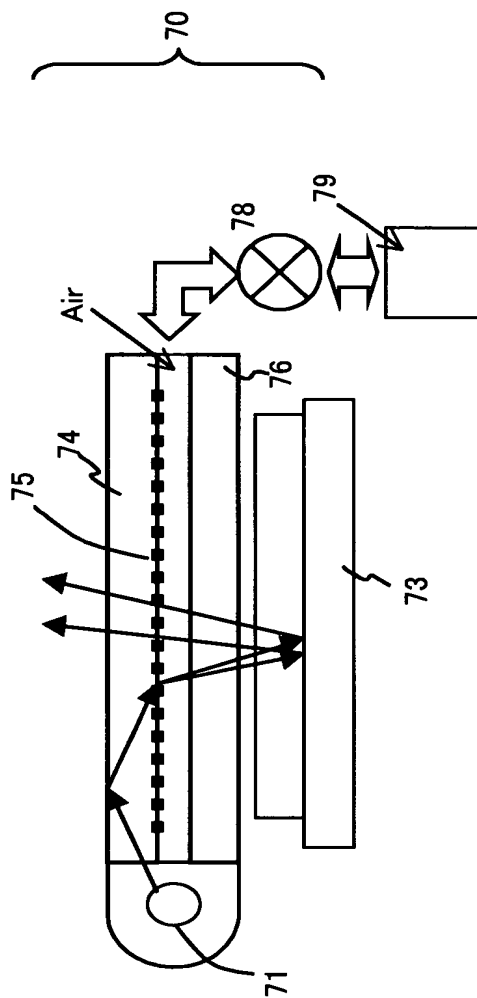


FIG. 50B
 At dark place

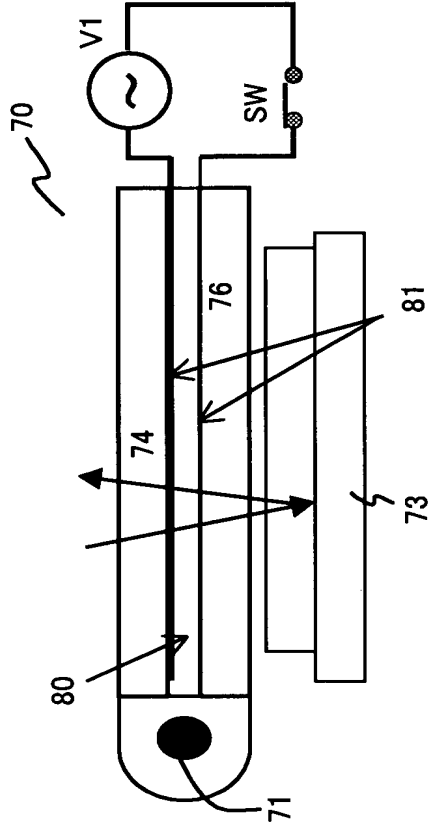


FIG. 51A
 At bright place

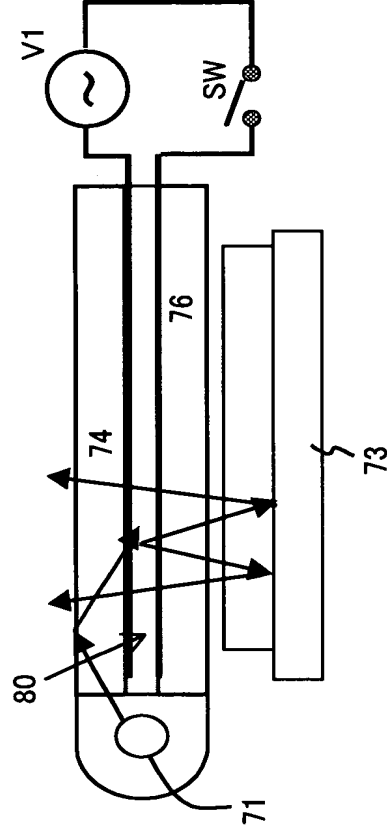
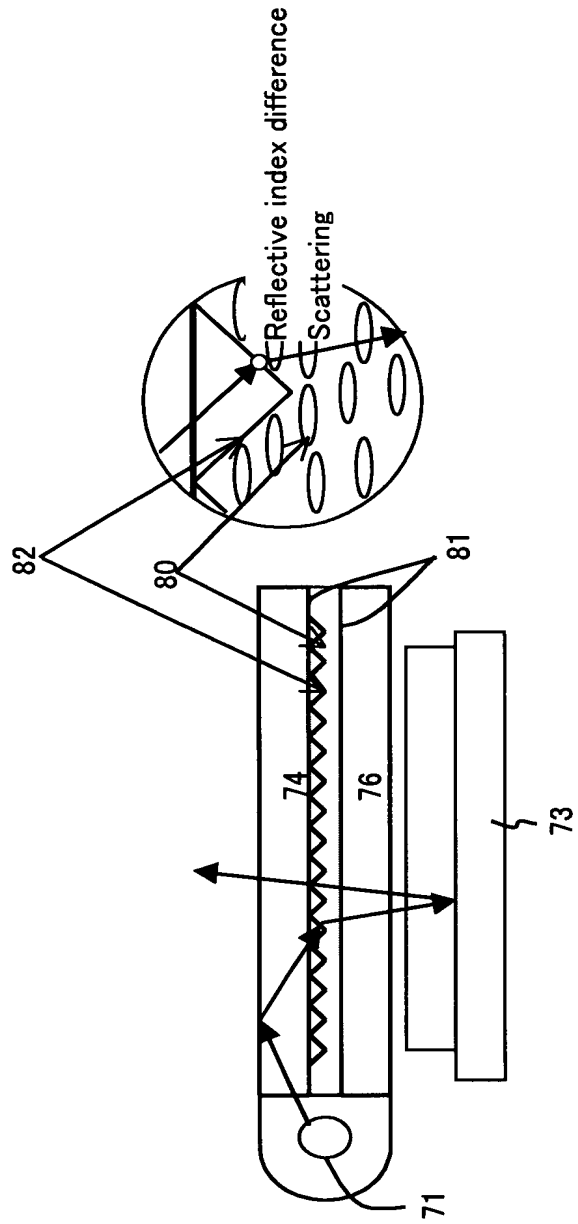
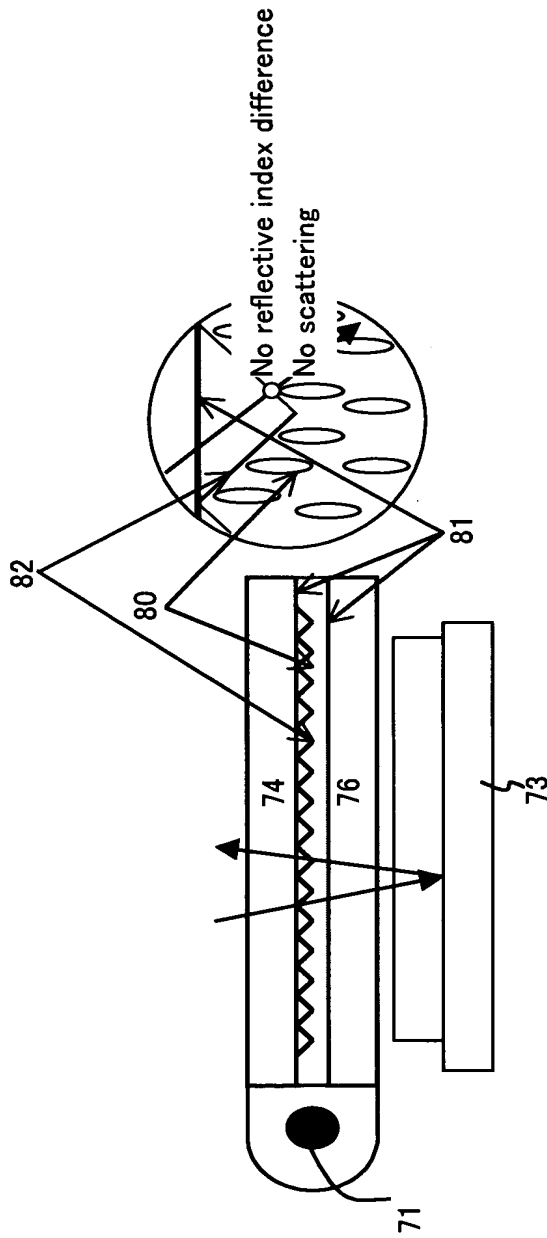


FIG. 51B
 At dark place



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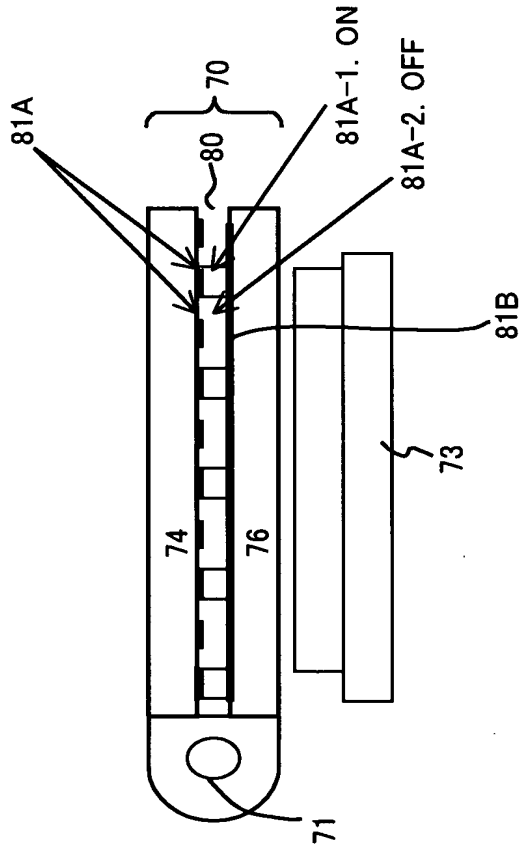


FIG. 53A

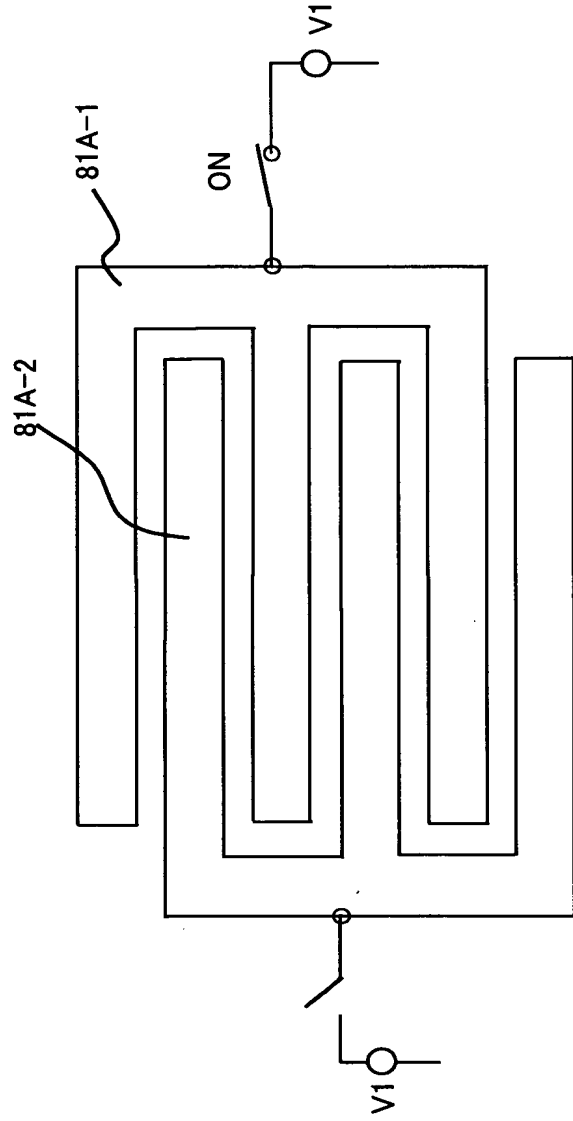


FIG. 53B

FIG.54A

At bright place

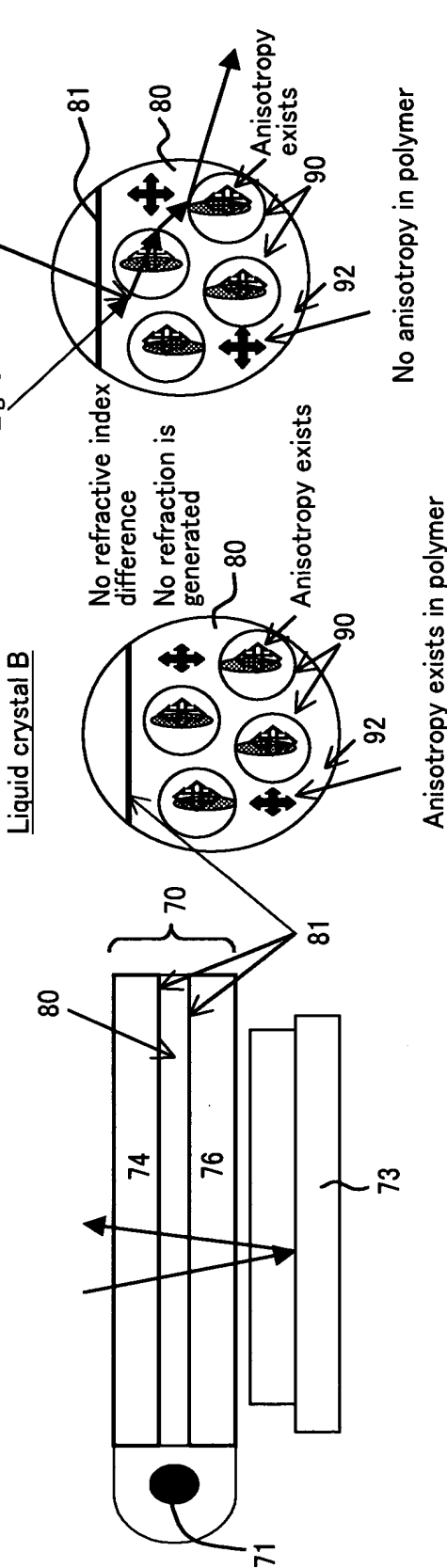
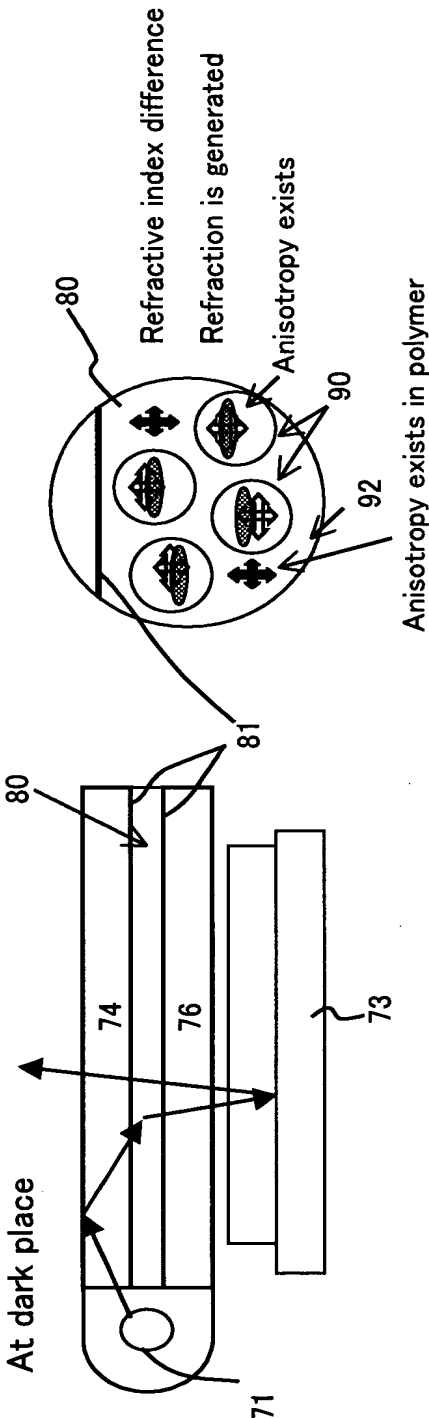


FIG.54B

At dark place



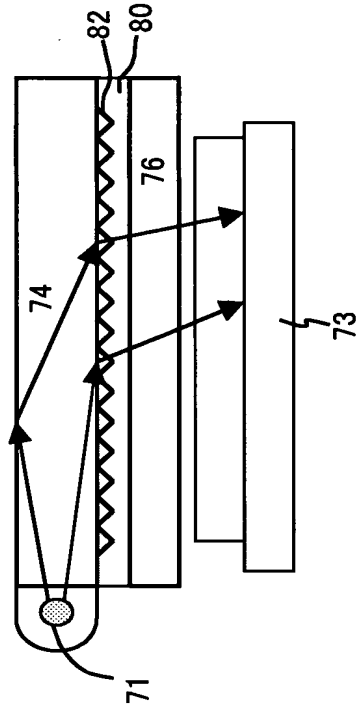


FIG. 55

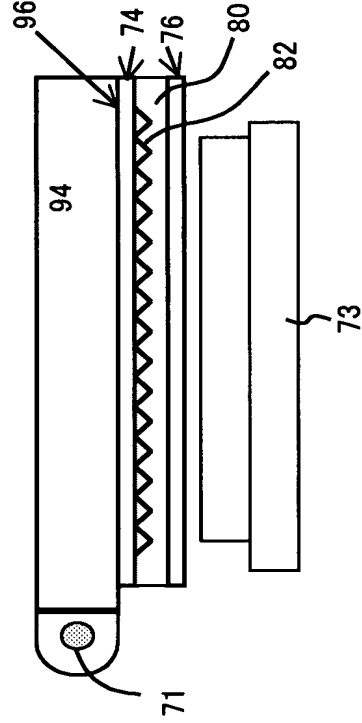


FIG. 56

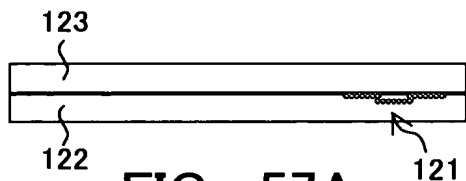


FIG. 57A

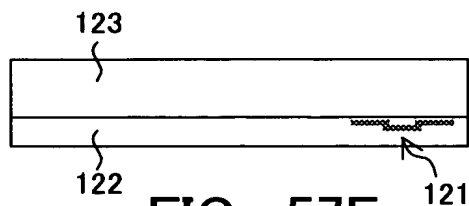


FIG. 57F

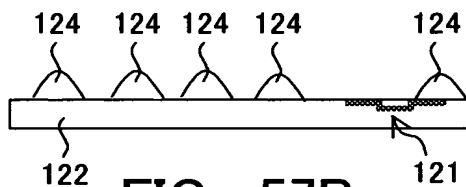


FIG. 57B

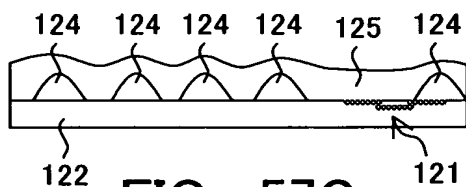


FIG. 57C

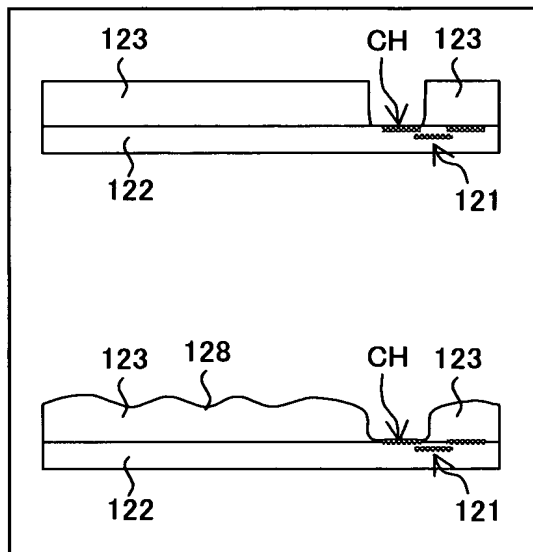


FIG. 57G

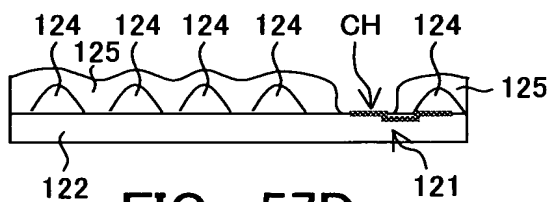


FIG. 57D

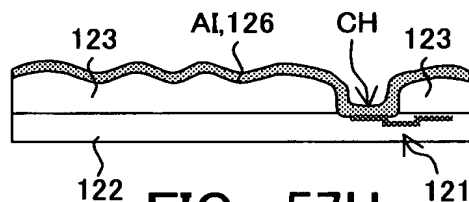


FIG. 57H

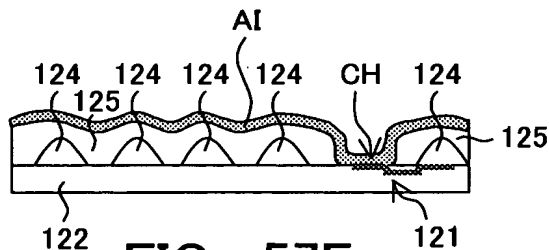
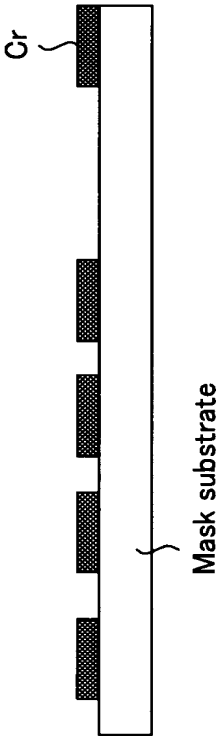


FIG. 57E

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1st Exposure mask for half exposure



2nd Exposure mask for CH

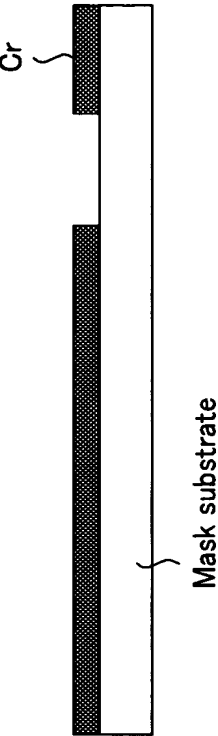
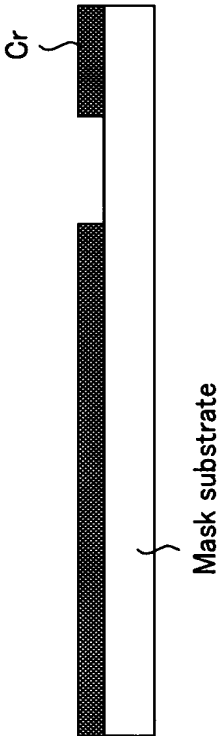
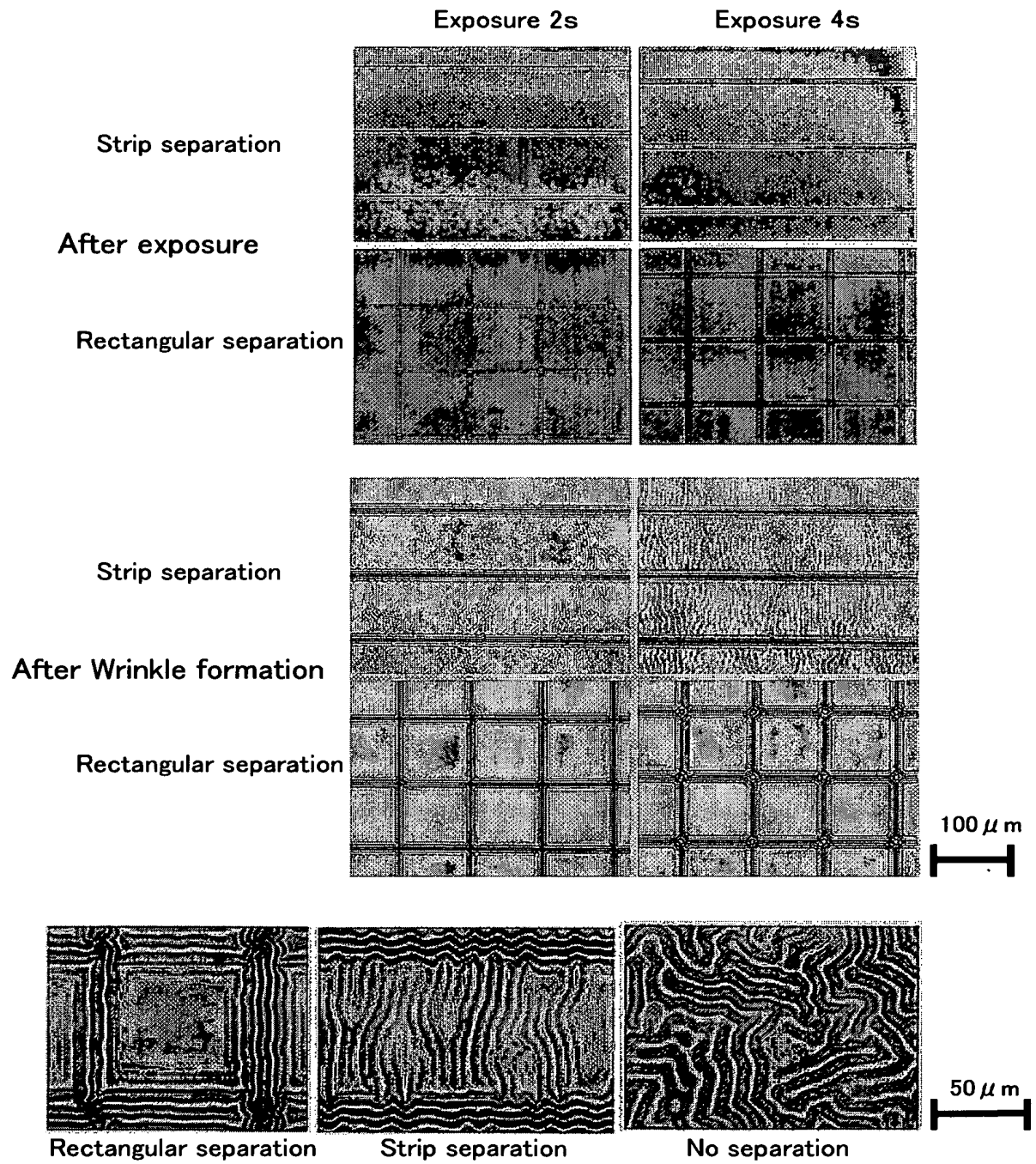


FIG. 58A

FIG. 58B

FIG. 59



208TTO" 60ZT50DT

FIG. 60

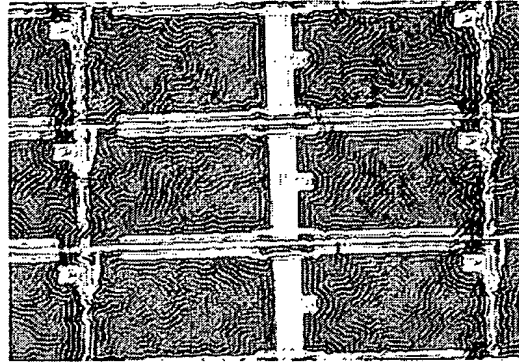
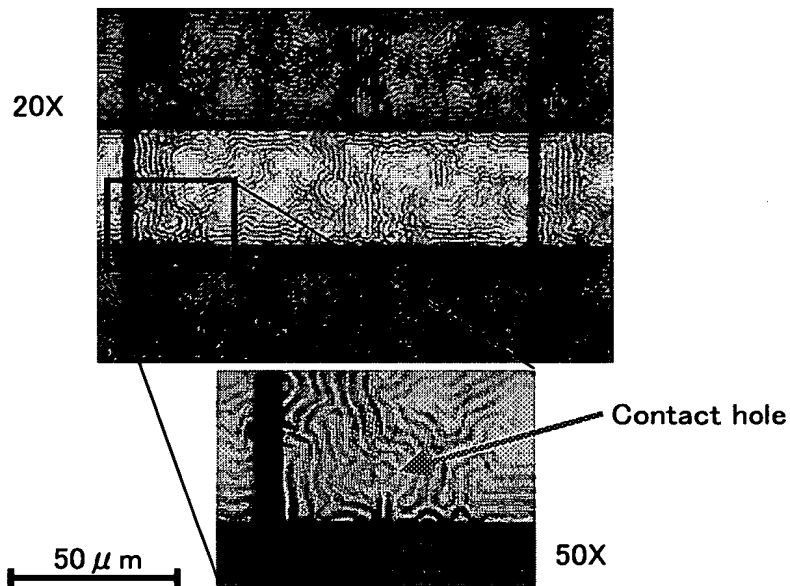


FIG. 61



208TFO"60ZTS00F

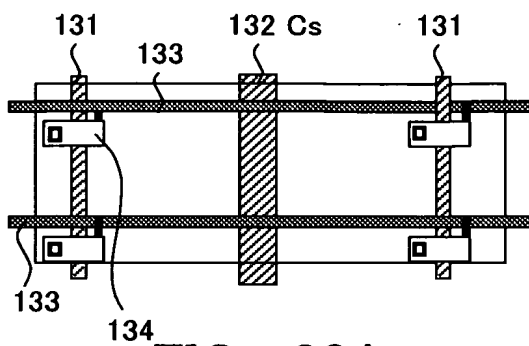


FIG. 62A

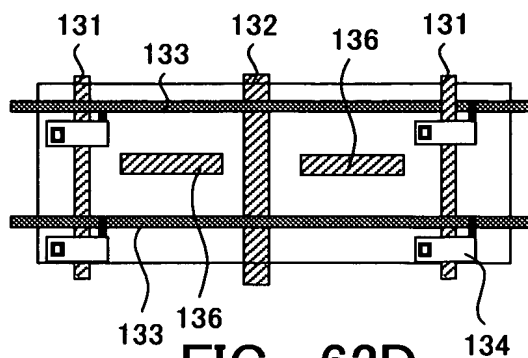


FIG. 62D

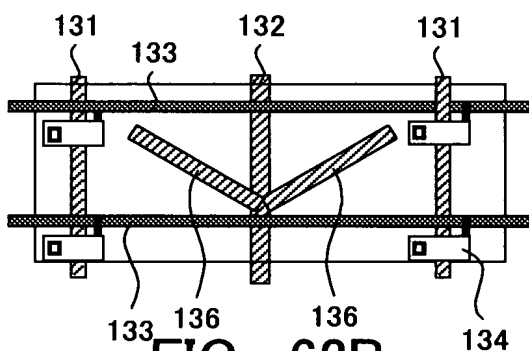


FIG. 62B

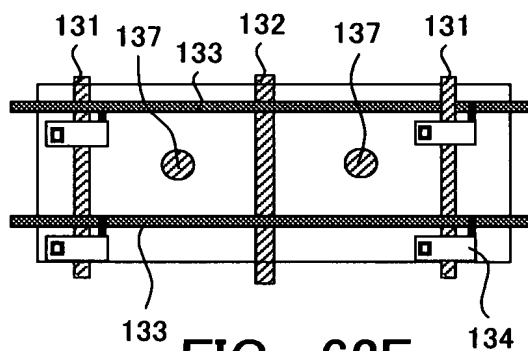


FIG. 62E

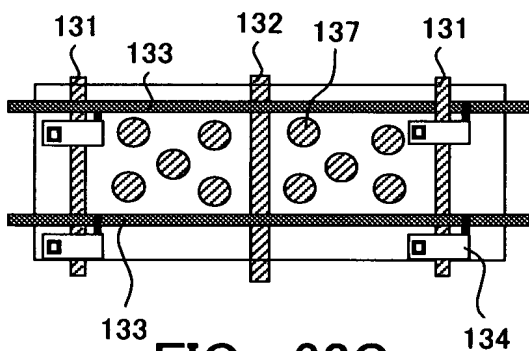


FIG. 62C

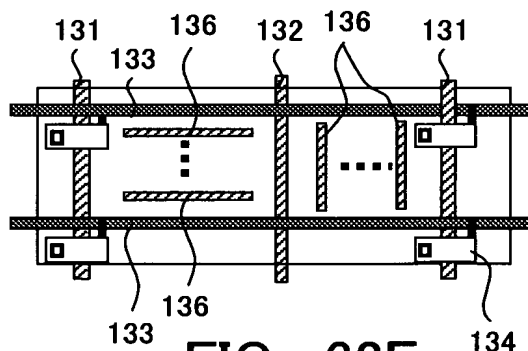


FIG. 62F

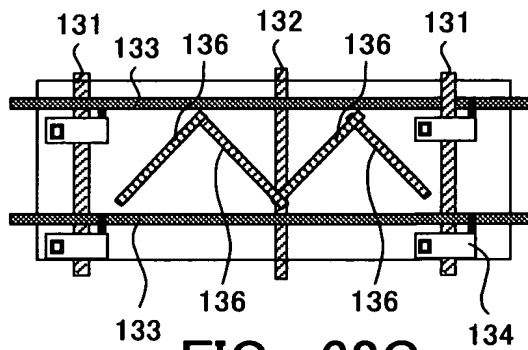


FIG. 62G

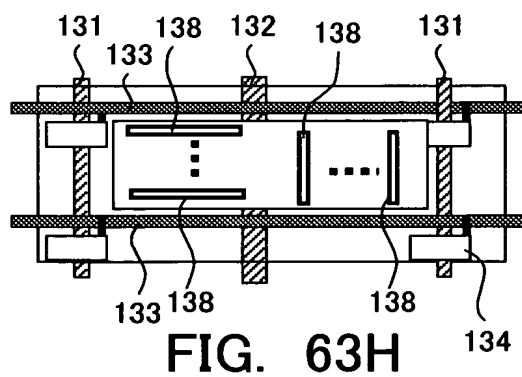
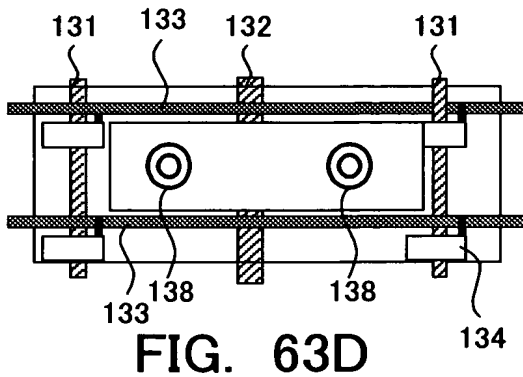
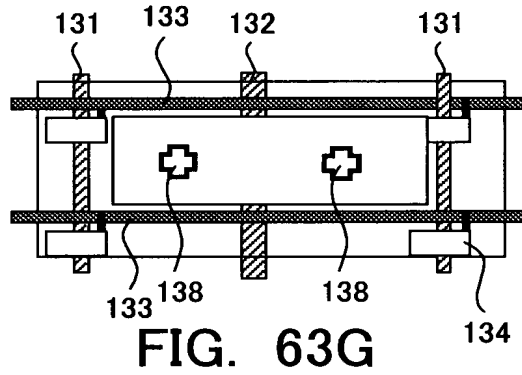
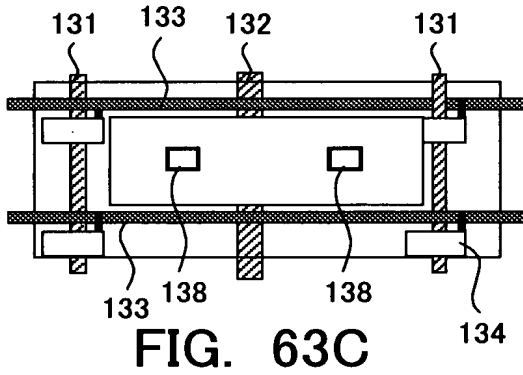
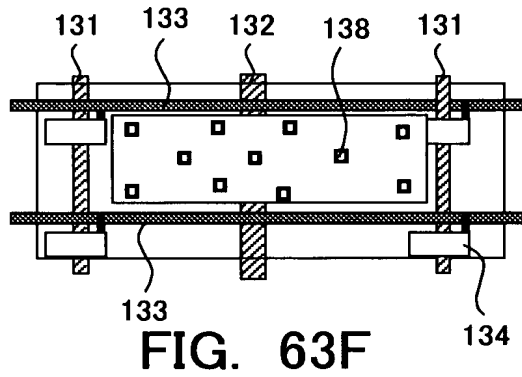
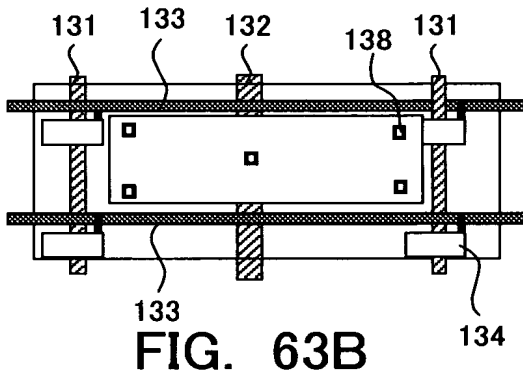
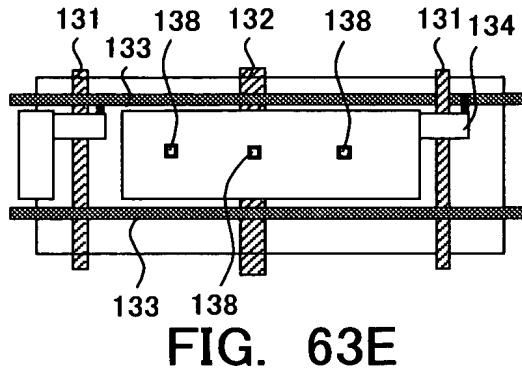
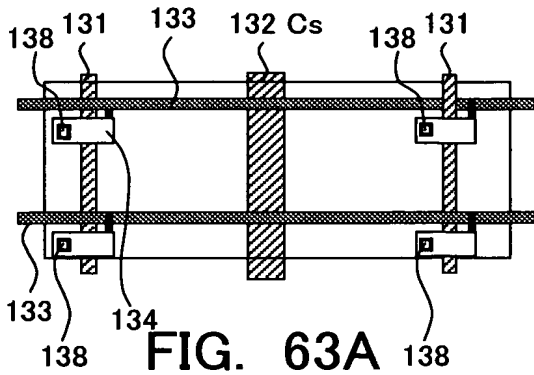


FIG. 64

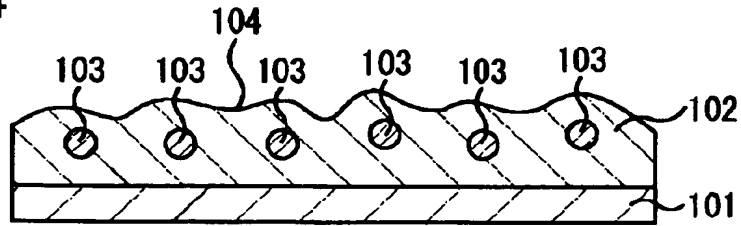


FIG. 65

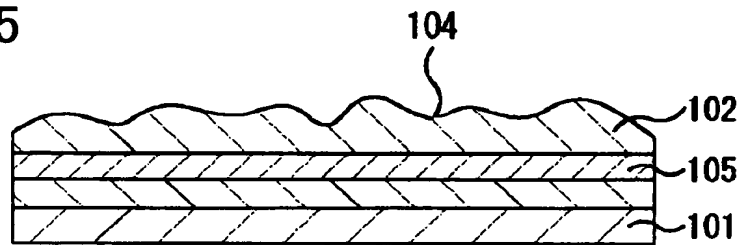


FIG. 66

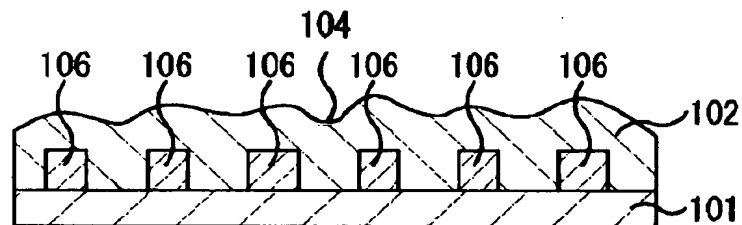
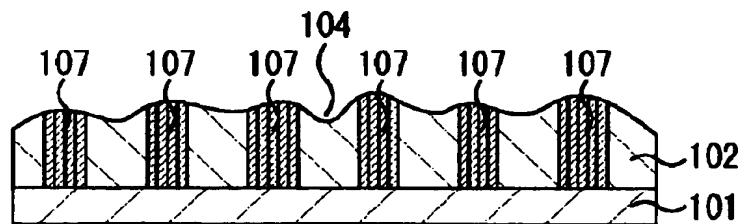


FIG. 67



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FIG. 68

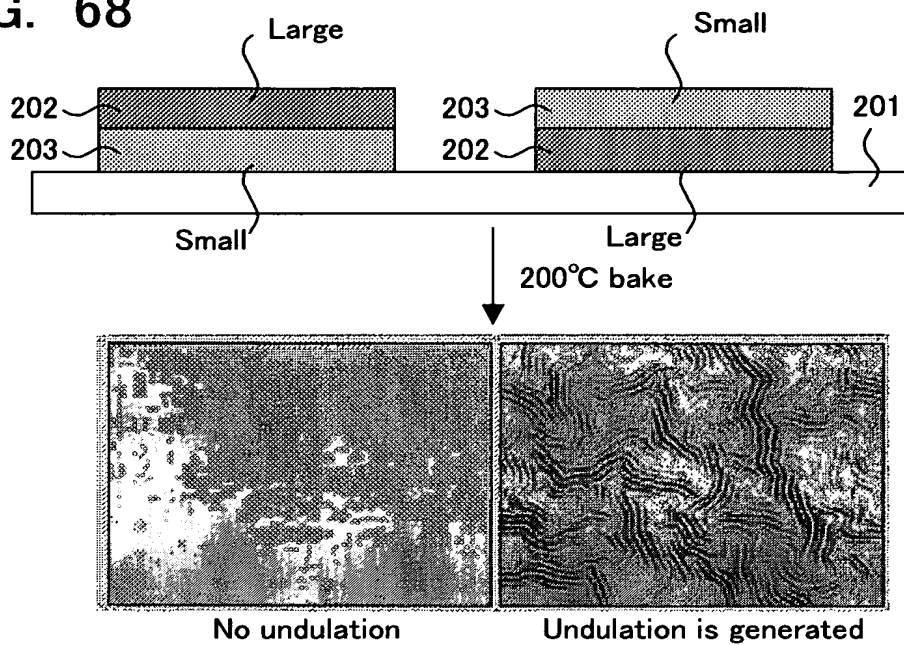


FIG. 69

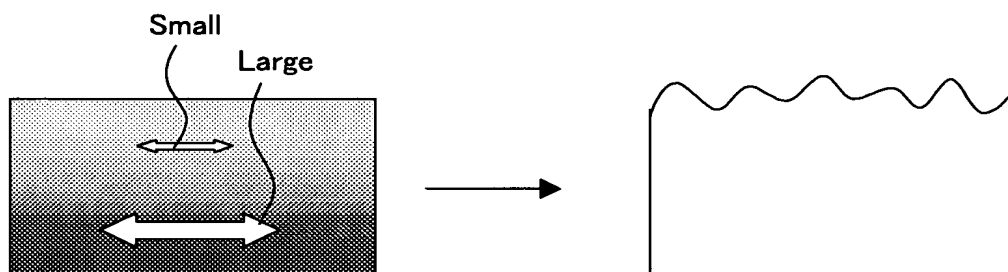
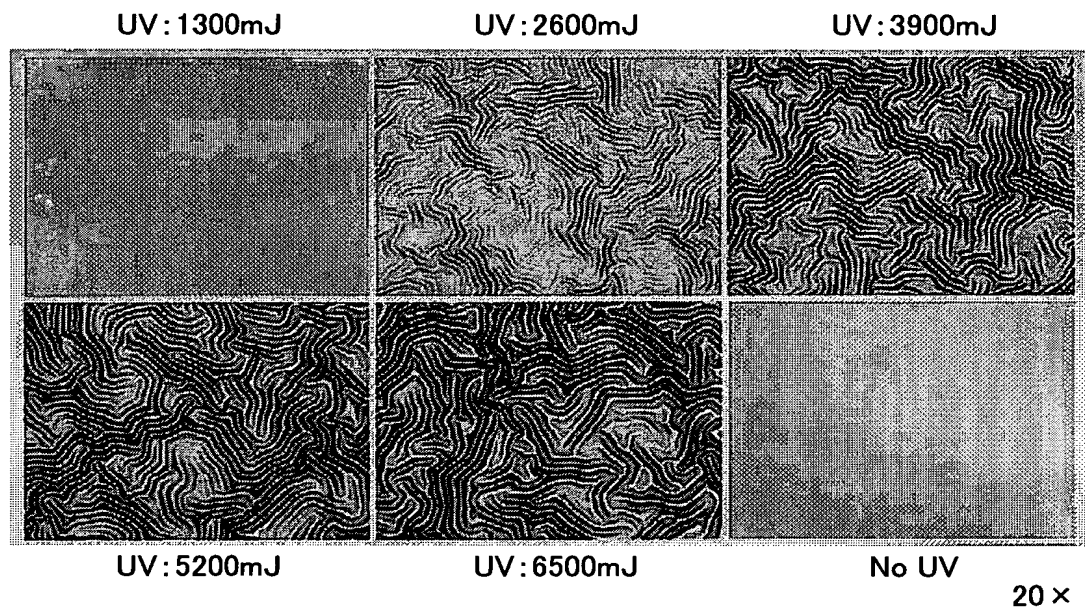


FIG. 70



FIG. 71



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FIG. 72

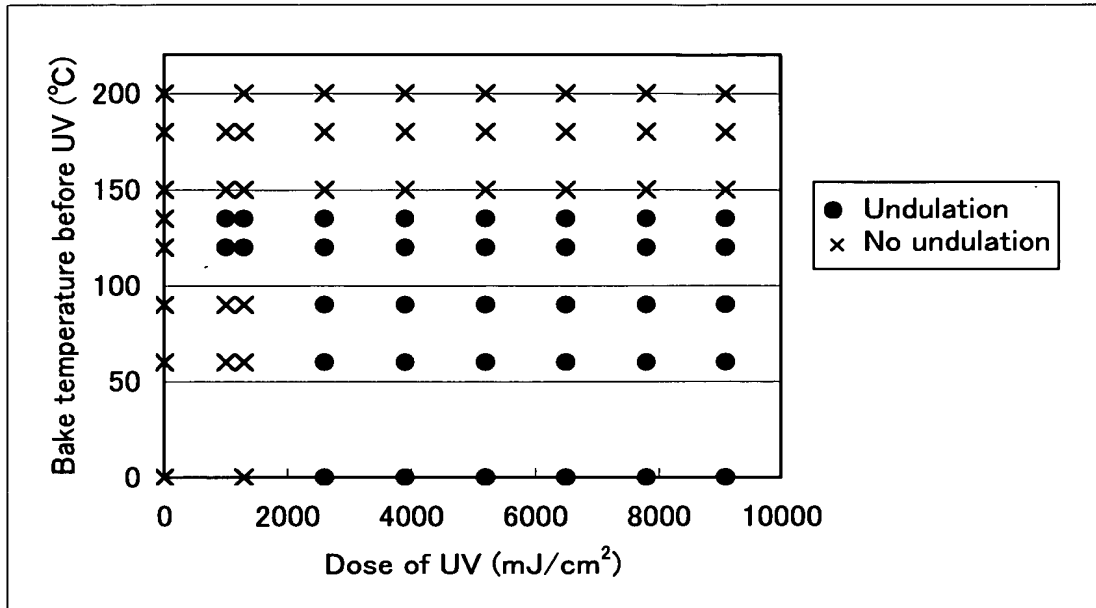


FIG. 73

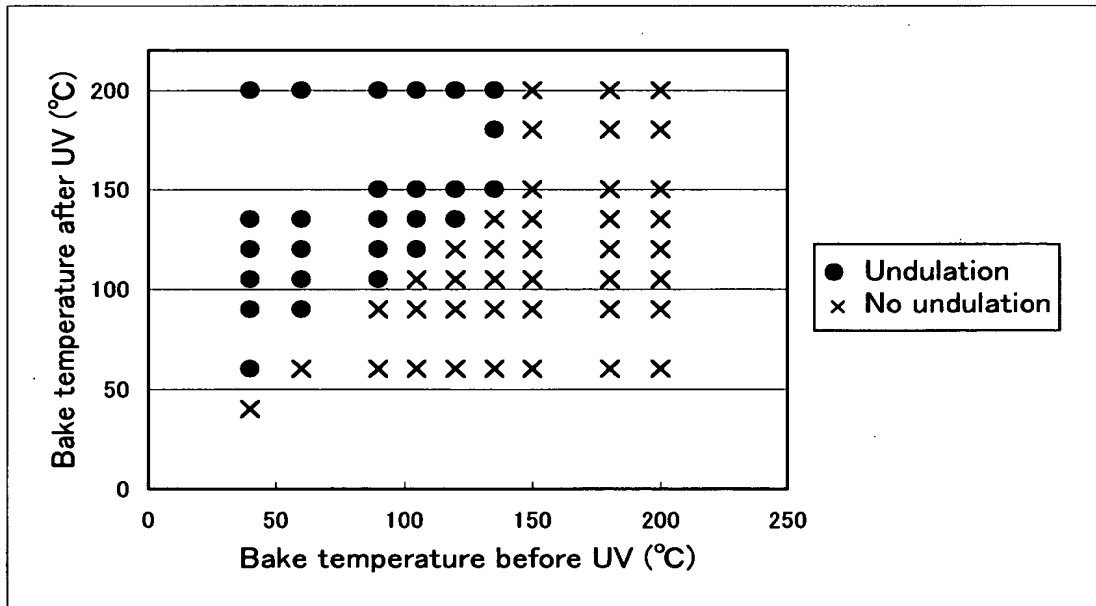


FIG. 74

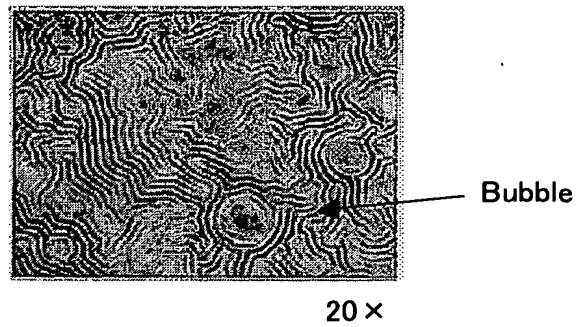
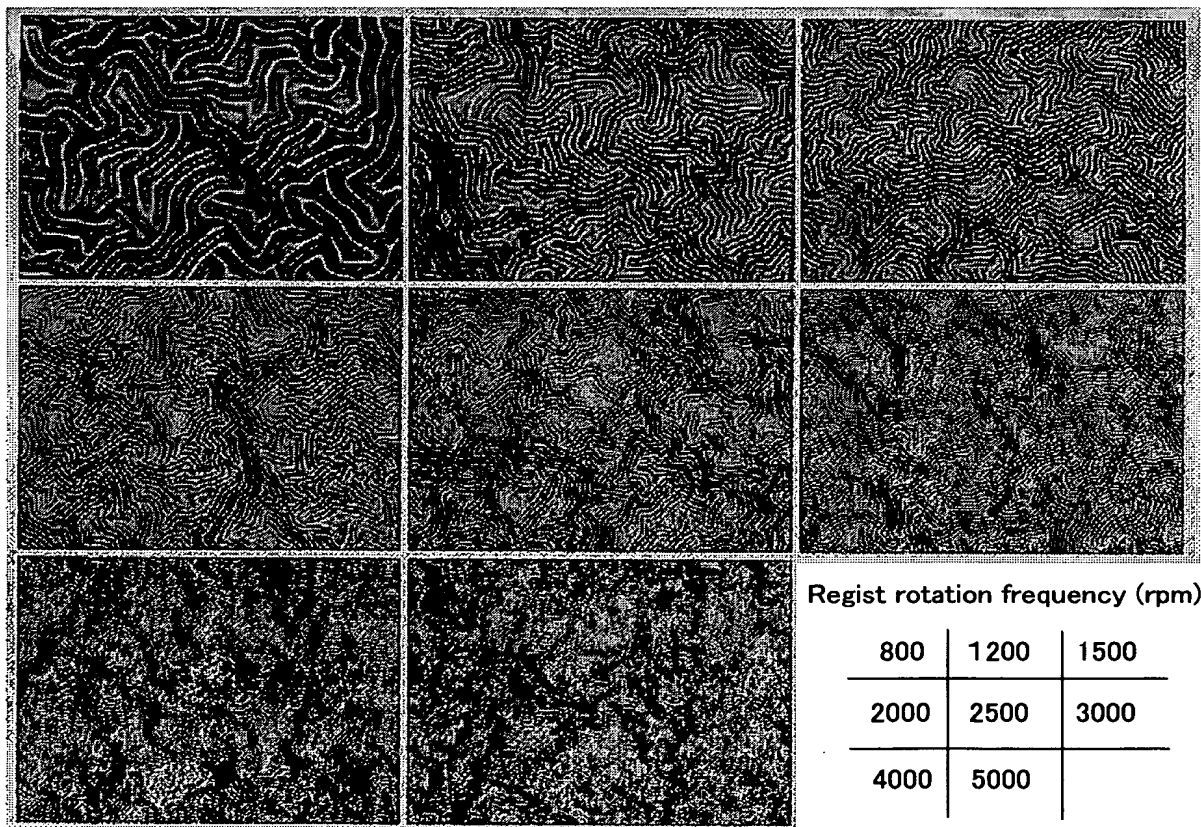


FIG. 75



20x

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FIG. 76

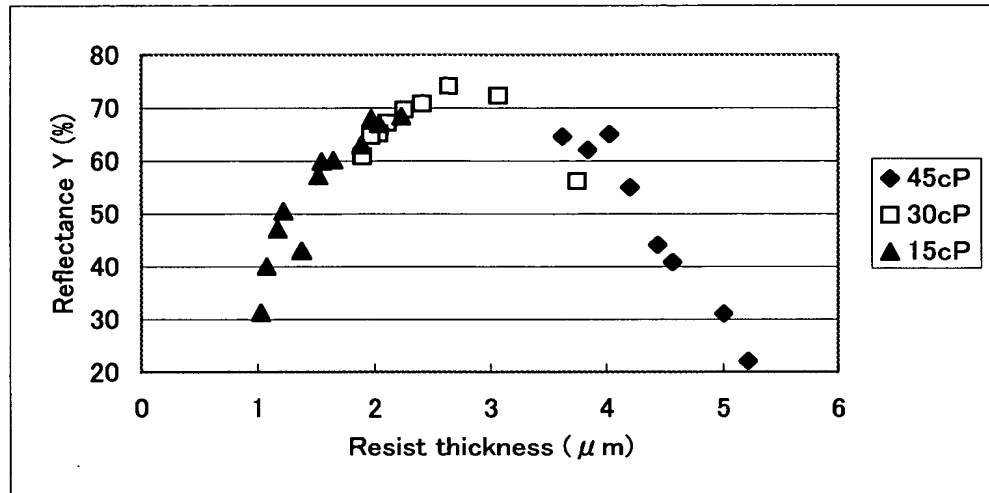


FIG. 77

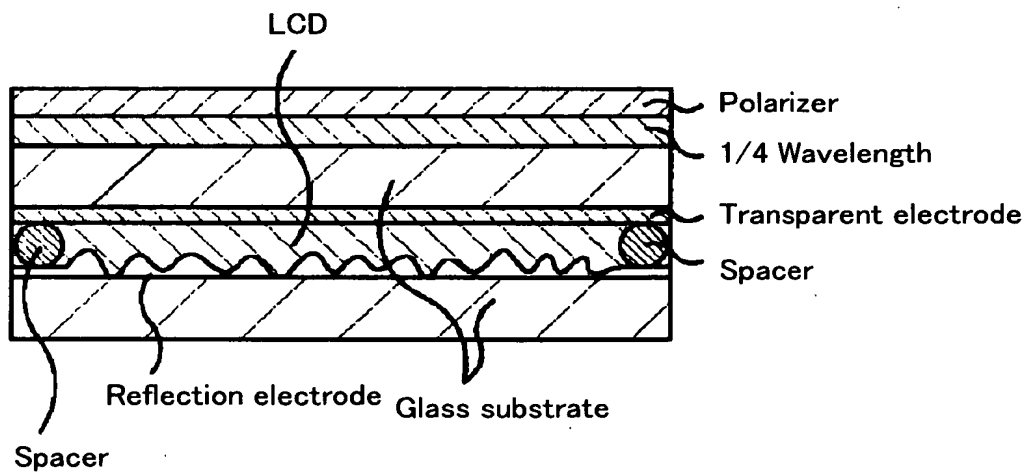


FIG. 78

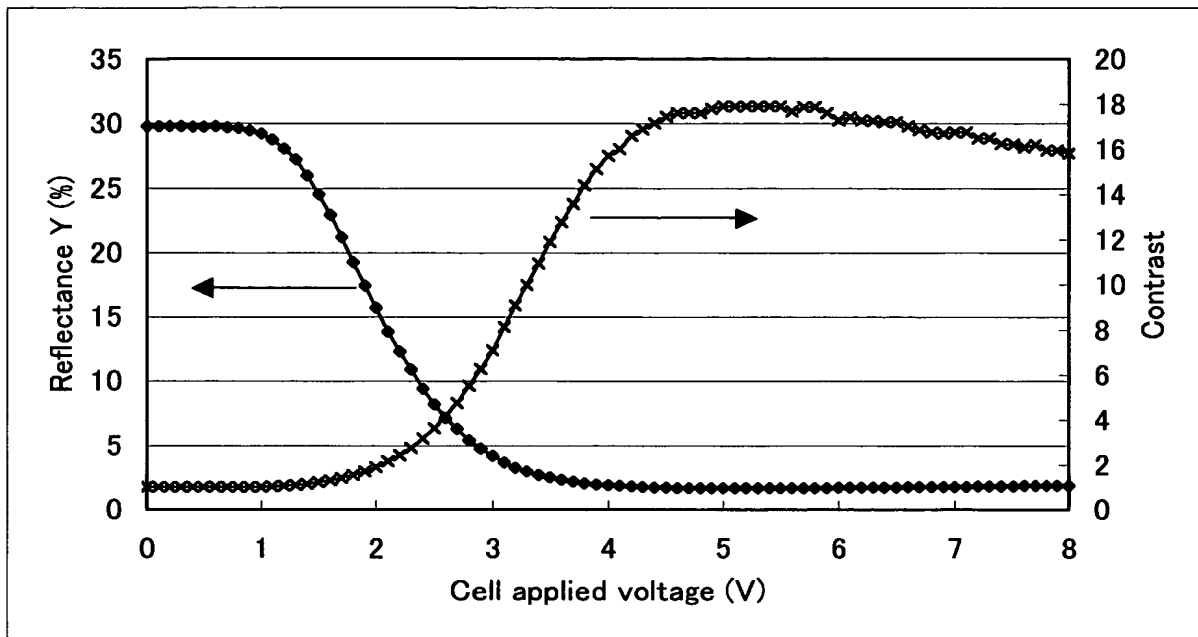


FIG. 79

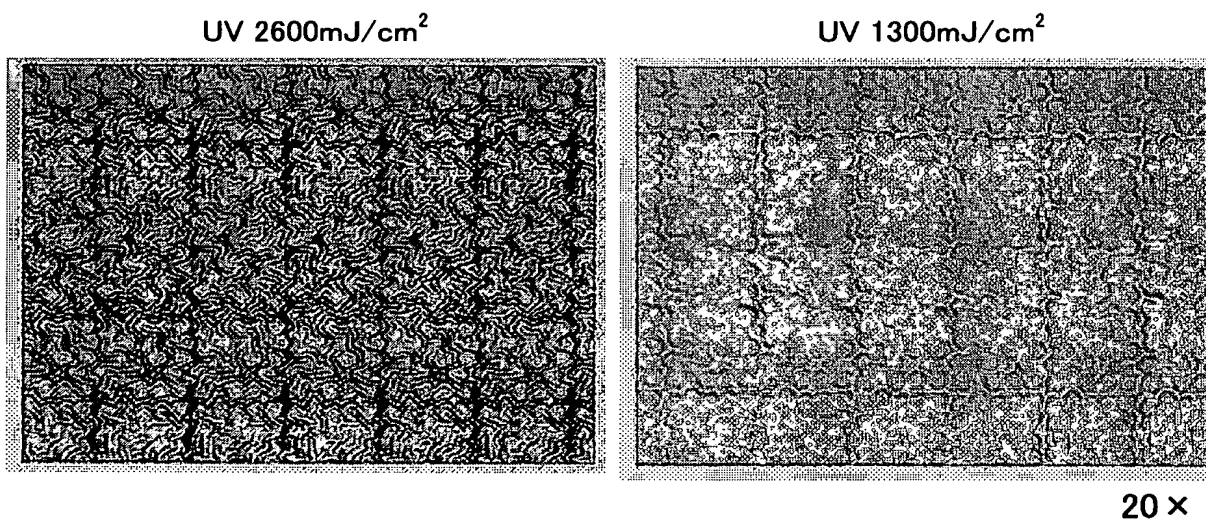
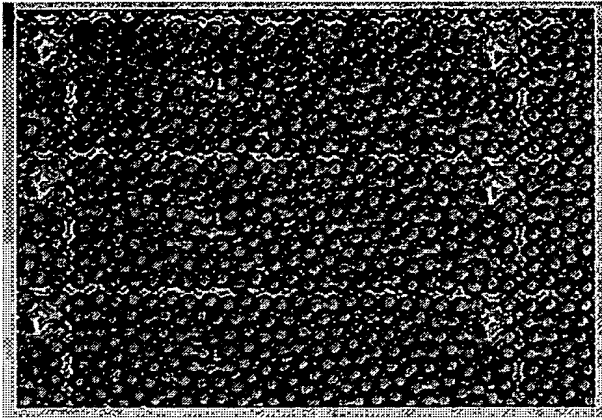
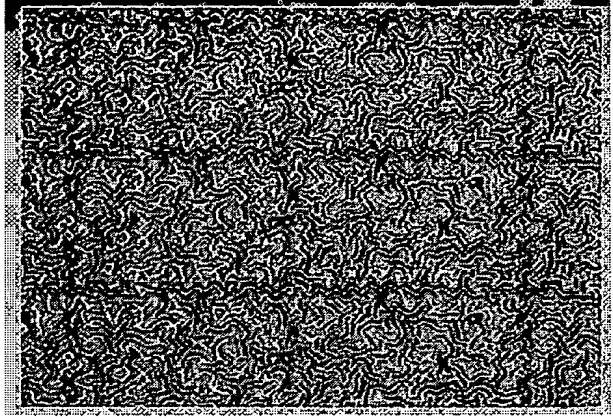


FIG. 80A



UV 80mJ/cm²

FIG. 80B



UV 35mJ/cm²

FIG. 81

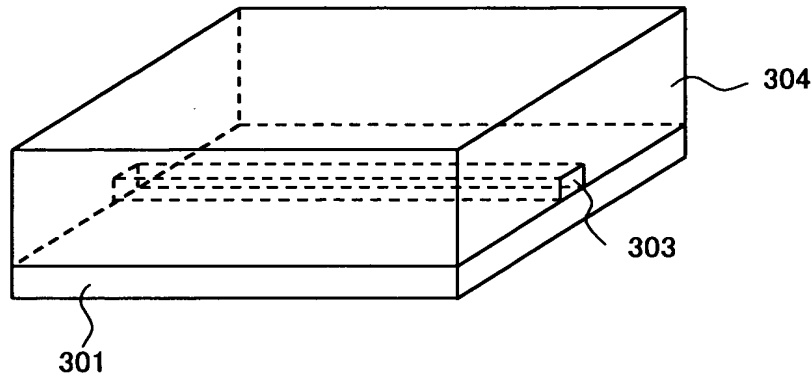
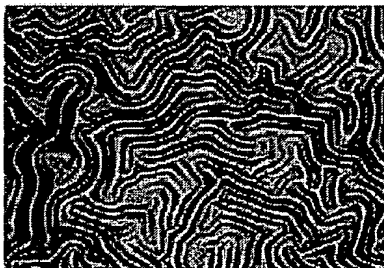
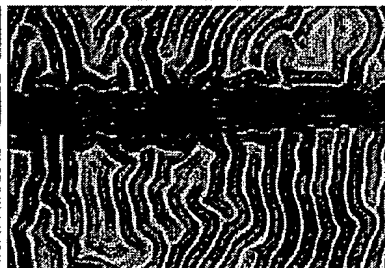


FIG. 82A



No undulation under resist

FIG. 82B



Undulation under resist

← Stripe undulation

20 ×

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FIG. 83A

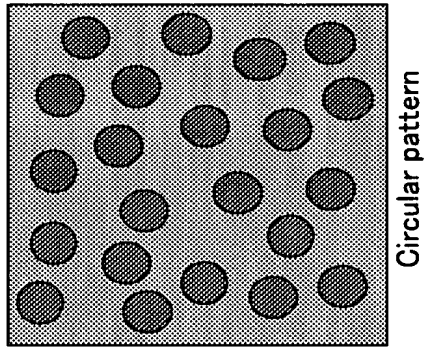


FIG. 83B

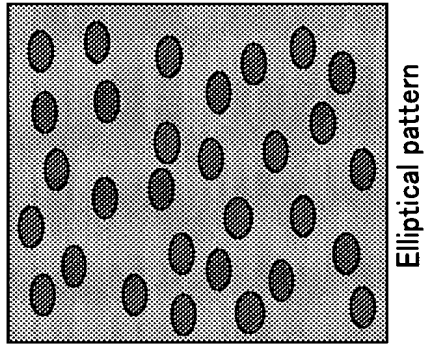


FIG. 83C

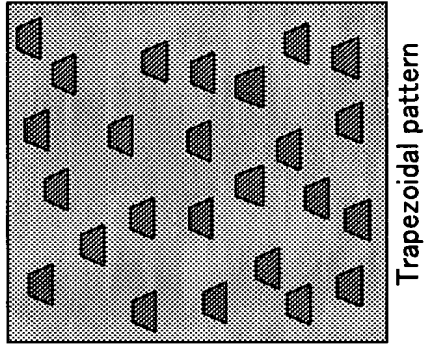


FIG. 83D

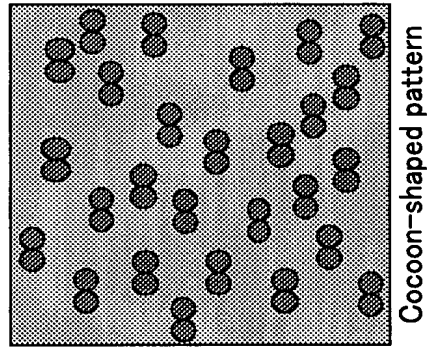


FIG. 83E

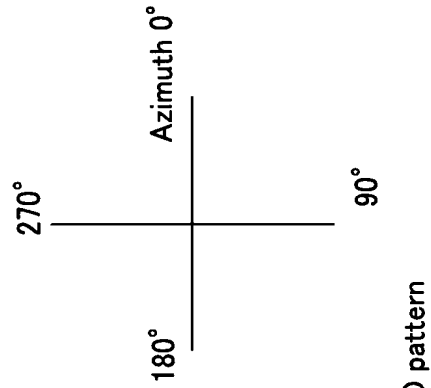
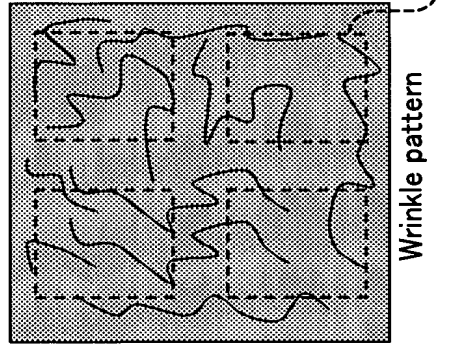


FIG. 84A

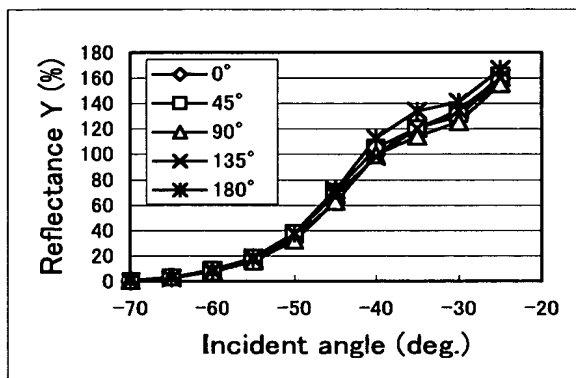


FIG. 84B

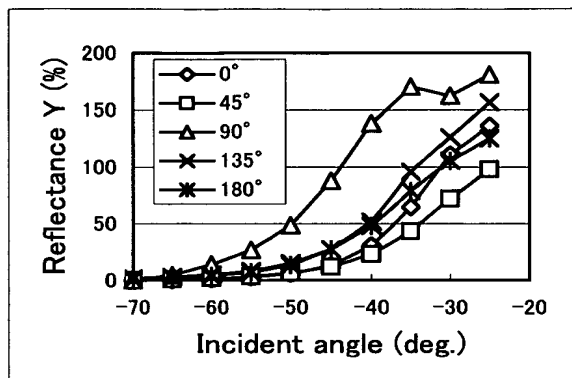


FIG. 84C

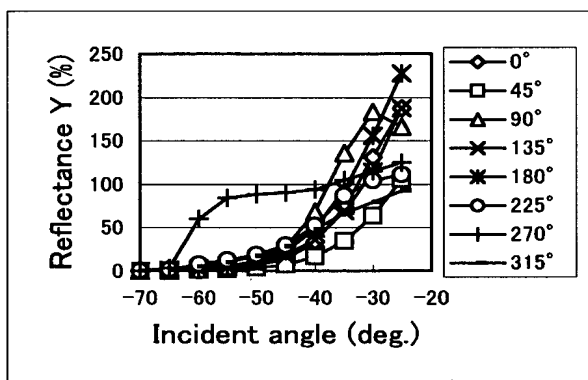


FIG. 84D

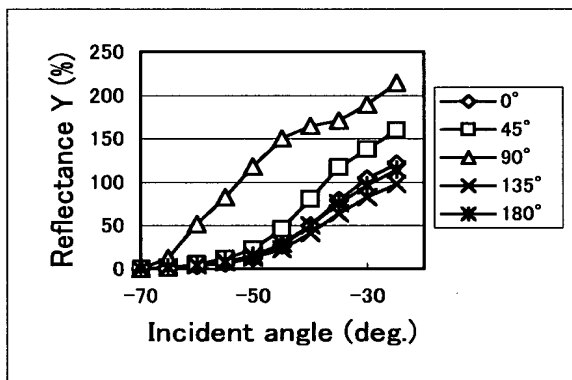
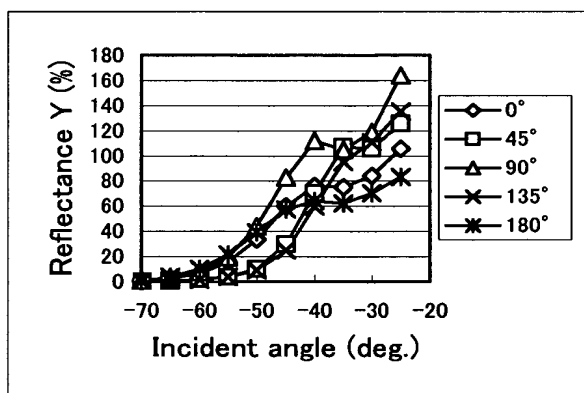


FIG. 84E



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FIG. 85

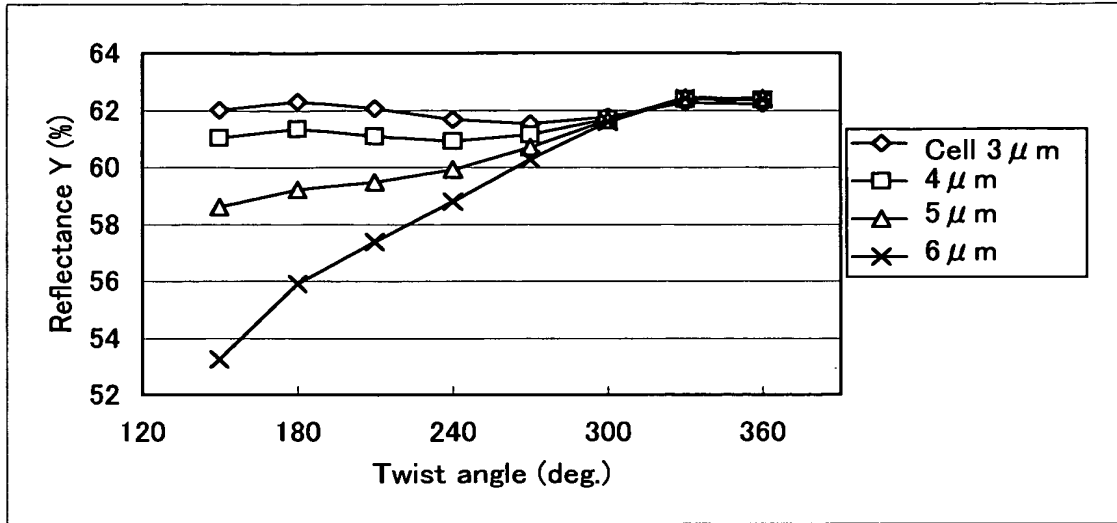


FIG. 86

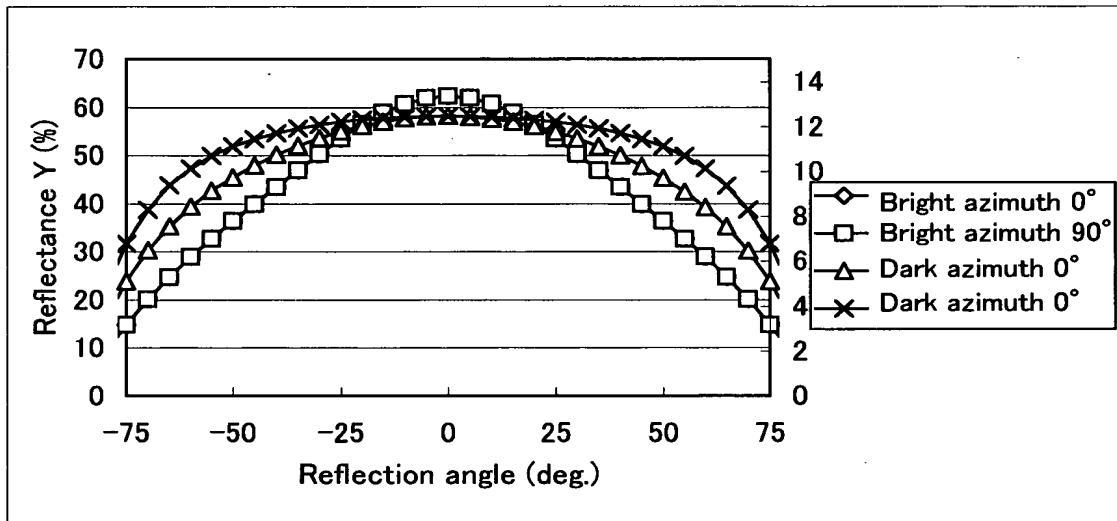


FIG. 87

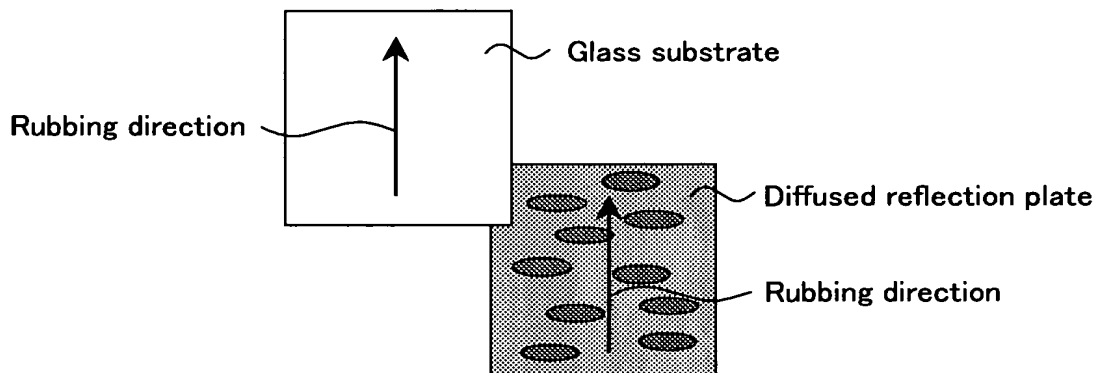


FIG. 88

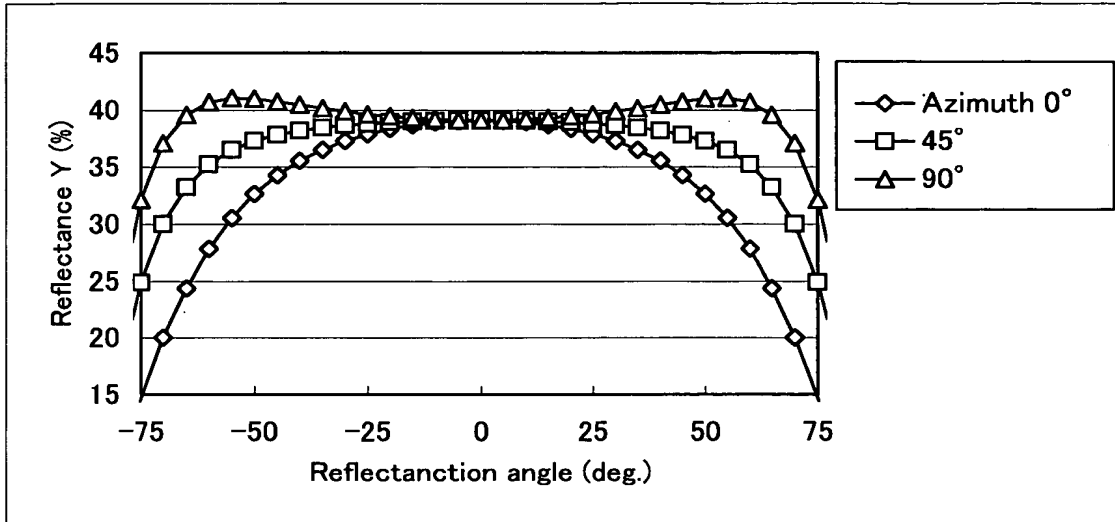


FIG. 89

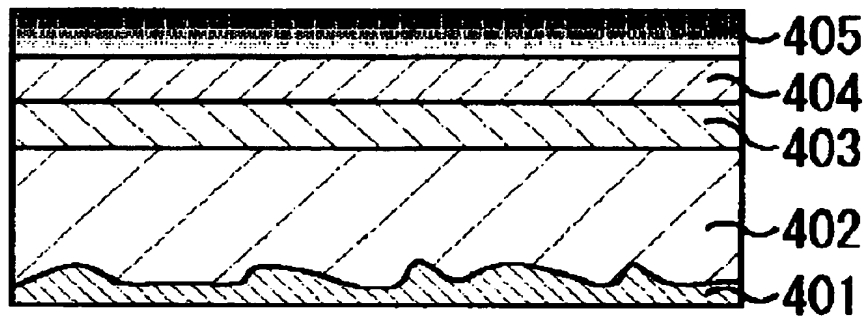
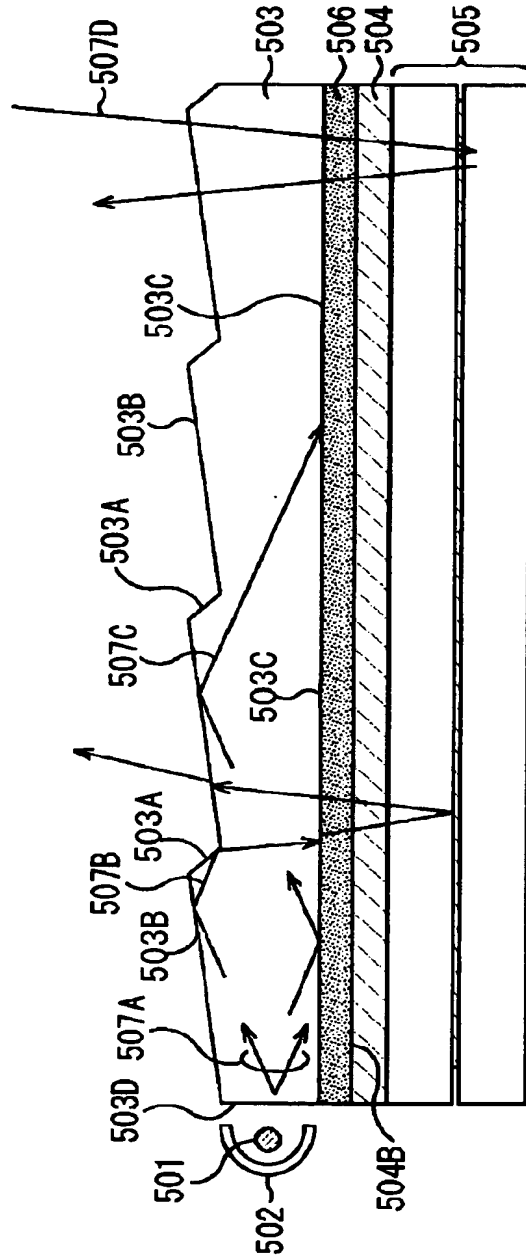
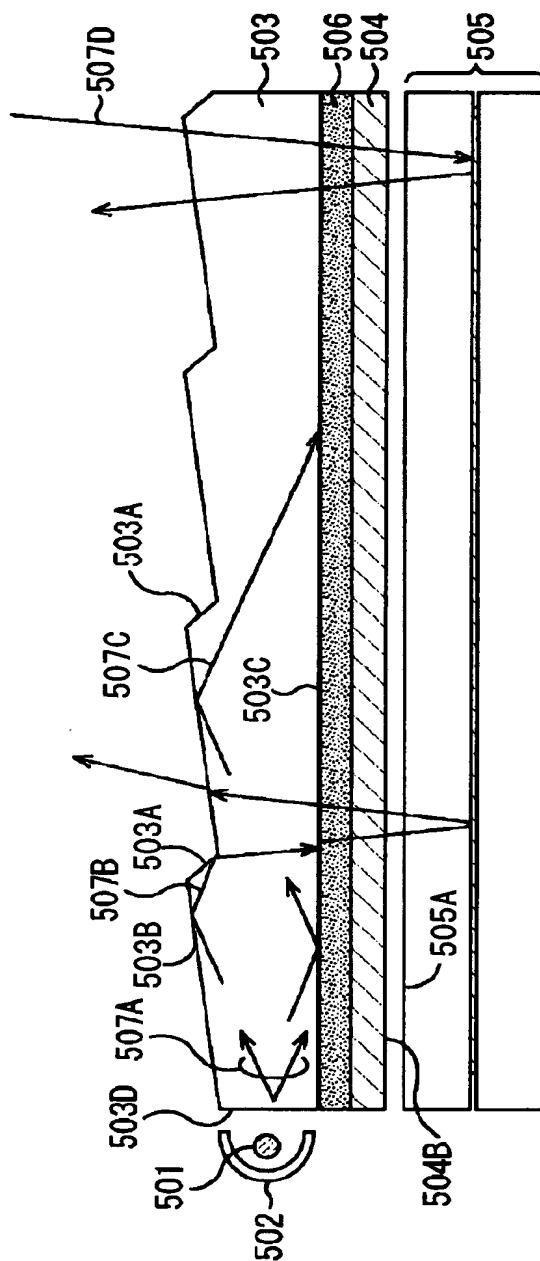


FIG. 90



1051209-01190E



1051709-011304

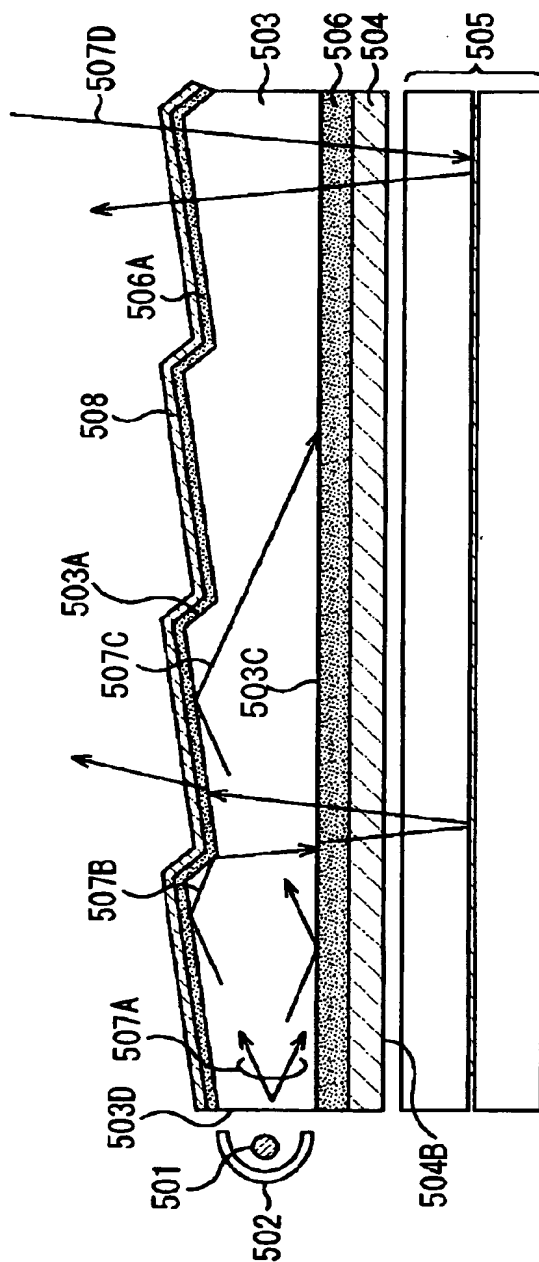


FIG. 93

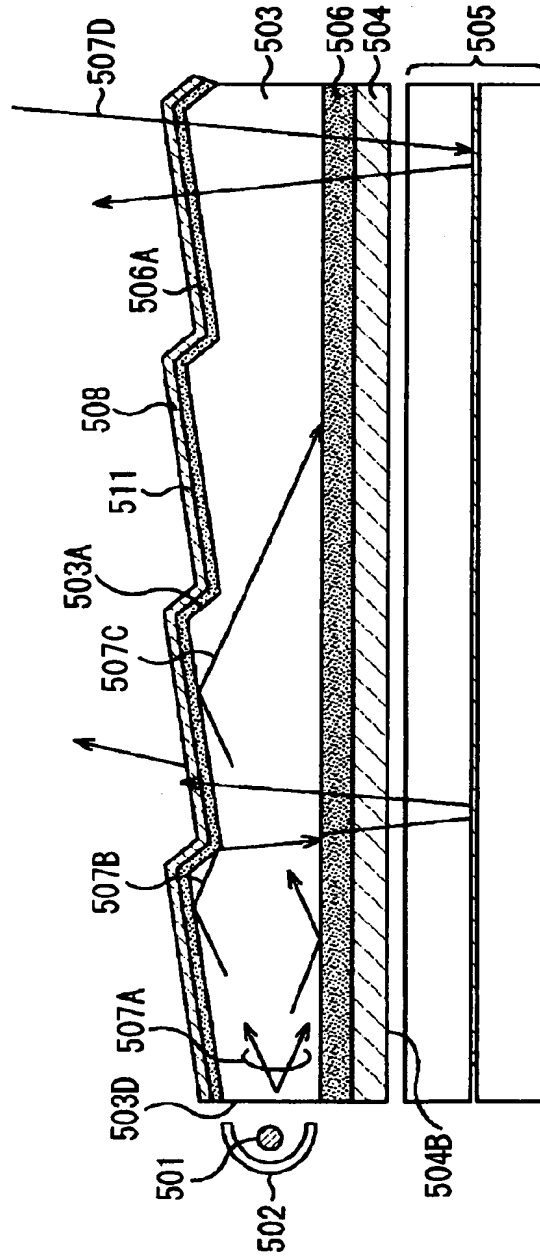
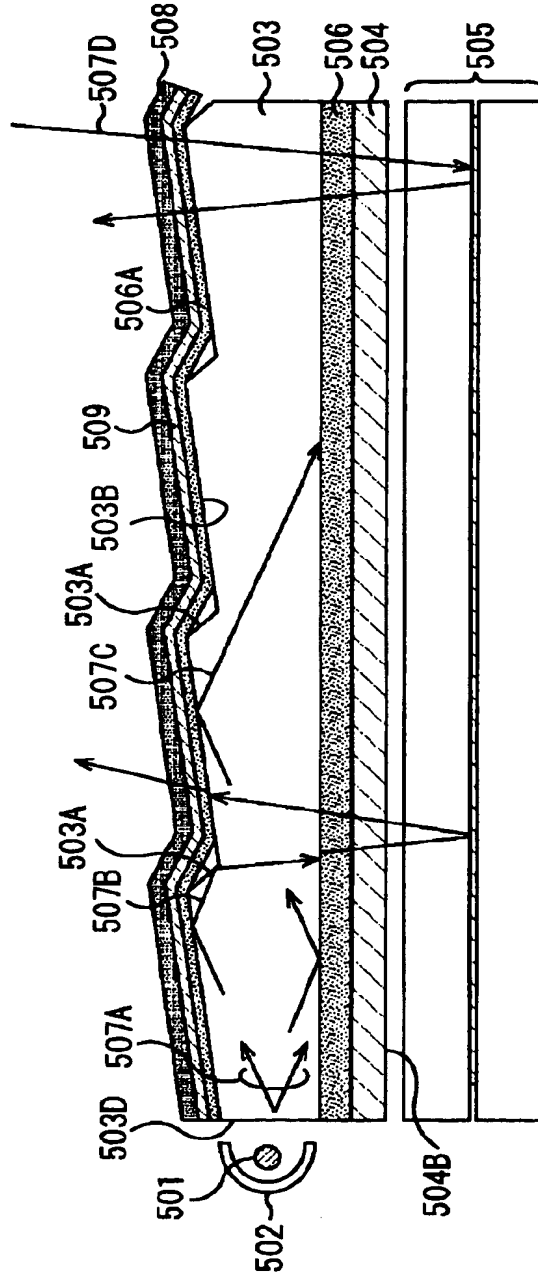


FIG. 94



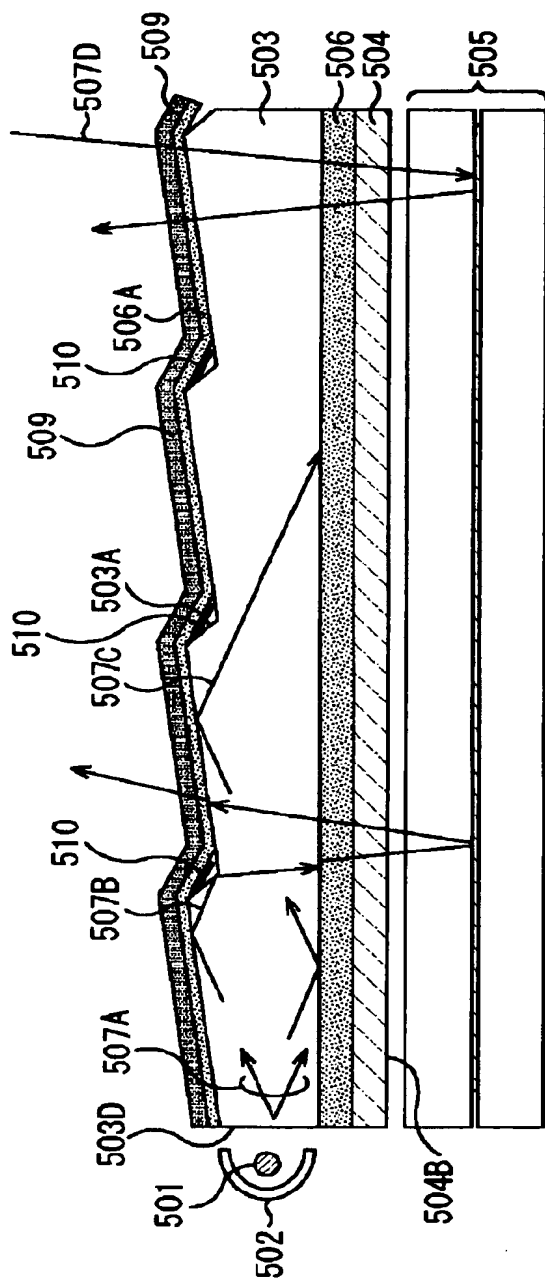


FIG. 95A

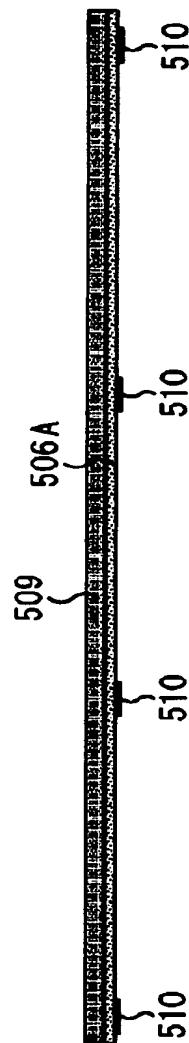
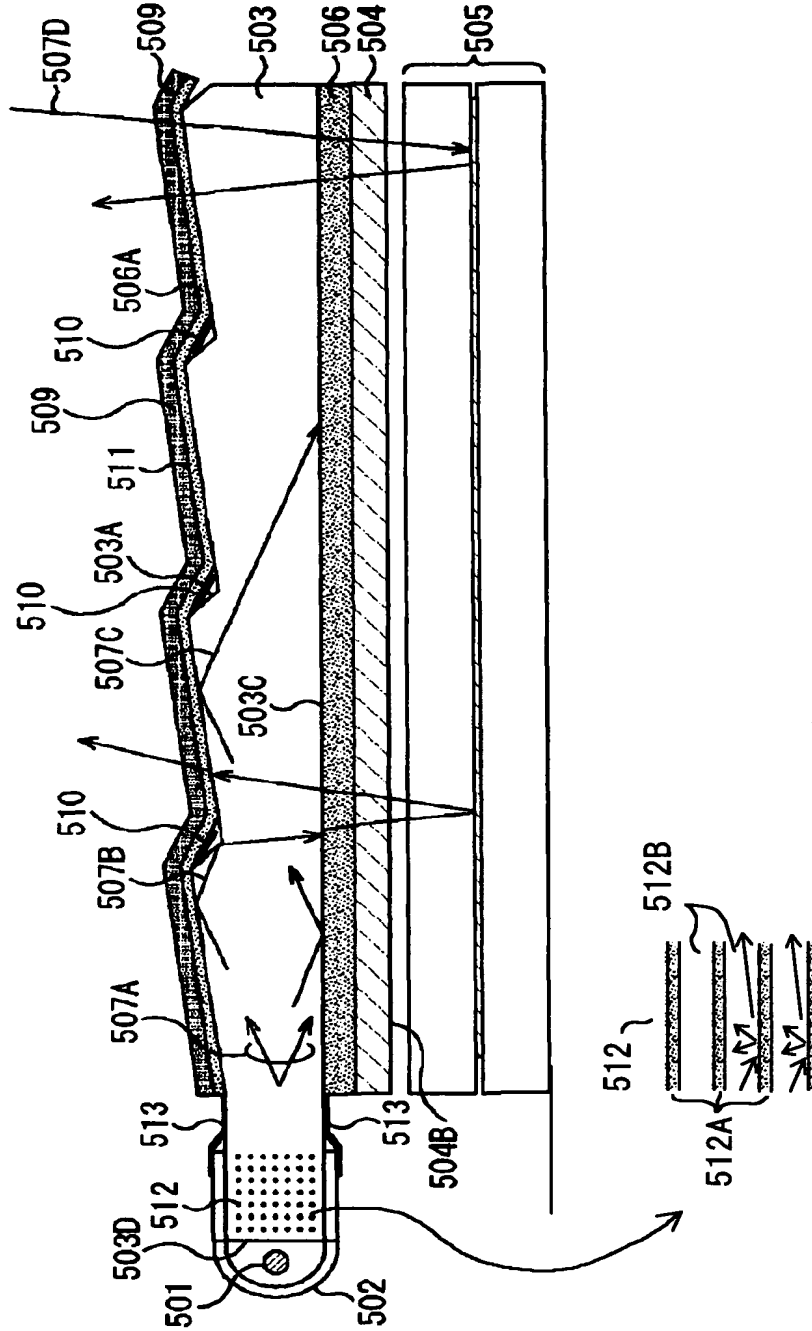


FIG. 95B

FIG. 96



2087FO" 602FS00T

FIG. 97

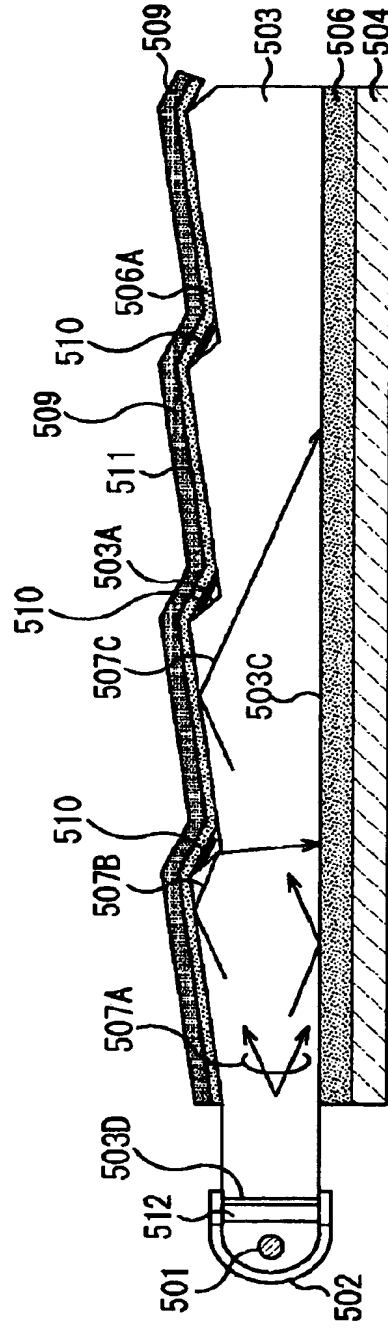


FIG. 98

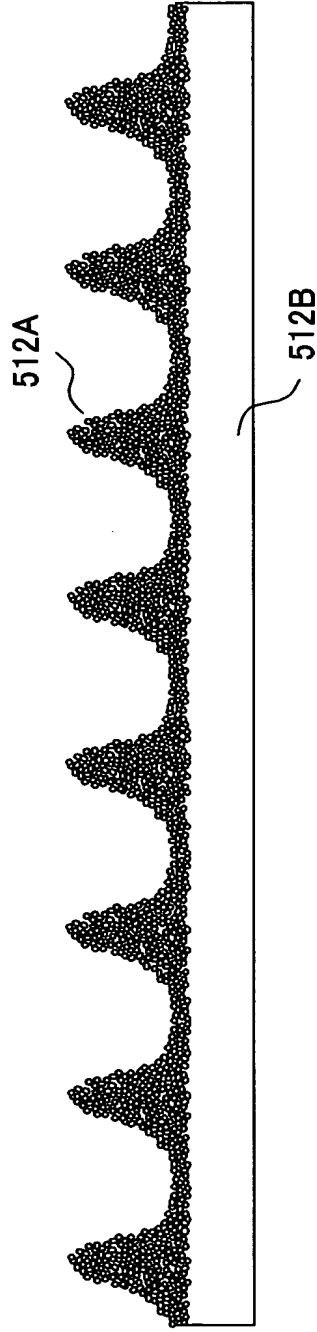


FIG. 99

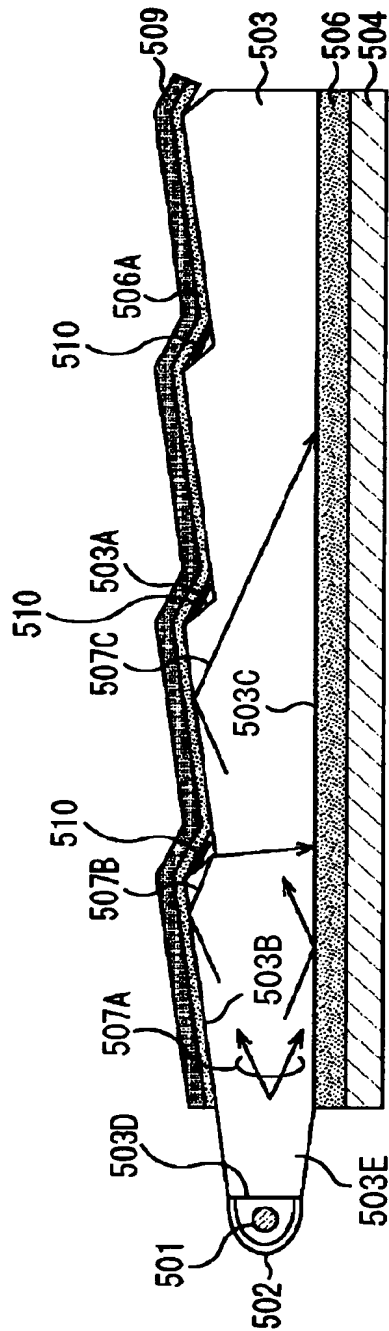
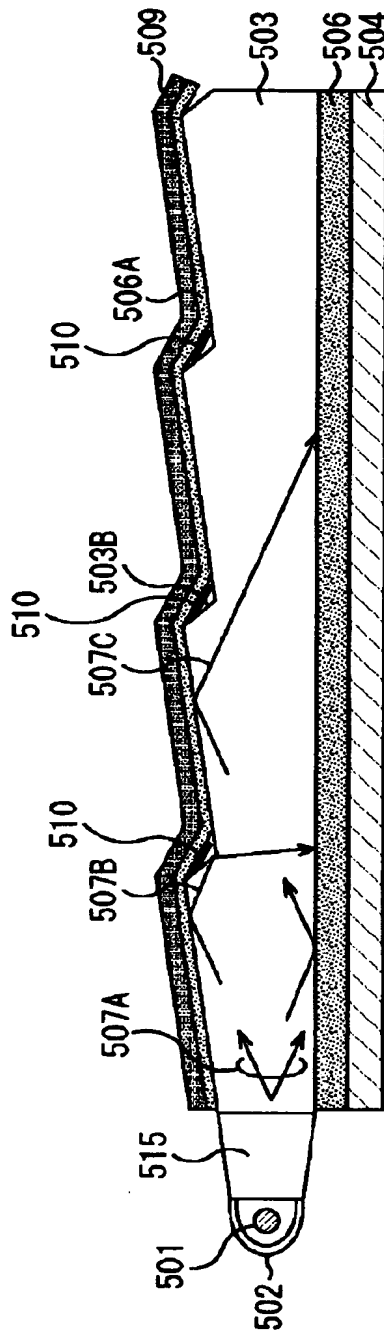
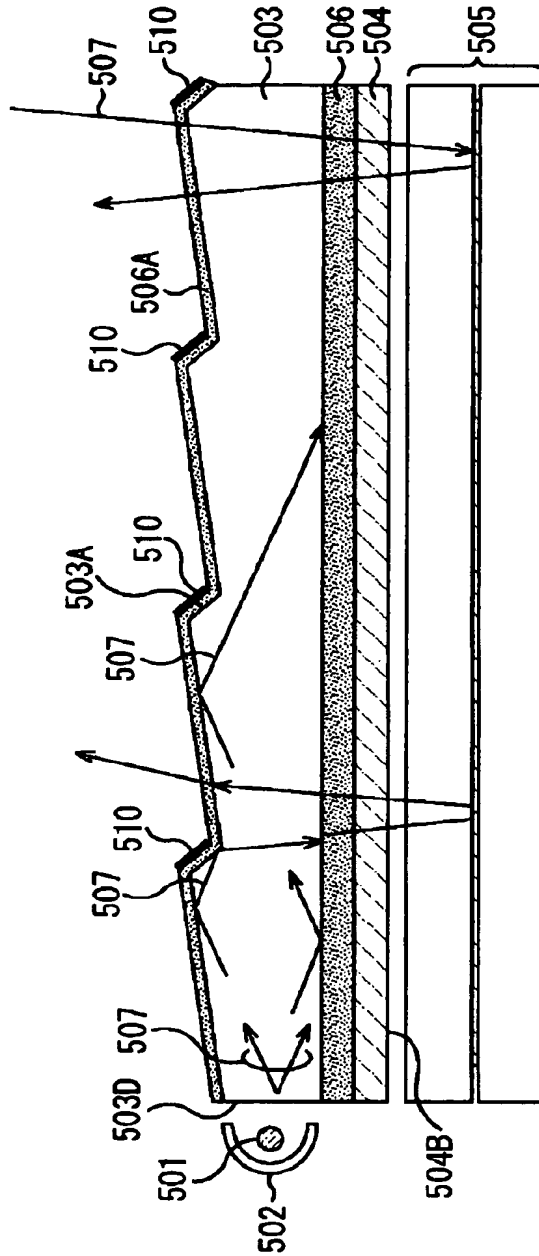


FIG. 100



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FIG. 101



203FF0" 60/TS00T

FIG. 102

